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PINCKNEYA PUBENS, MICHAUX.

(GEORGIA BARK.)

Natural order, Rubiaceæ; sub-order, Cinchoneæ.

BY EDGAR HERMAN NAUDAIN PH.G.

From an Inaugural Essay.

Michaux discovered this plant in 1791, along the banks of the St. Mary's River, Florida, and described it as follows: It grows in bogs along the banks of streams from Florida to South Carolina, near the coast, sometimes attains a height of twenty feet, though as it throws up many stems from the same root, it retains a shrub-like appearance. It has the general botanical characteristics of the Rubiaceæ, the leaves are large, oval, and acute; downy on the under surface as are the flower-clusters which are borne at the end of the branches. These consist of several five-flowered fascicles of purplish spotted flowers. Calyx short, three-lobed, one of the lobes being expanded into a large ovate rose-colored leaf, which is more showy than the flower itself.

The plant is closely related to the cinchonæ, and is one of the many that have been proposed as a substitute for Peruvian bark. From reports of physicians living in States where it grows, it appears to have decided anti-periodic properties, though slower in its action than cinchona bark. The genus was named in honor of Gen. Charles Pinckney, of South Carolina.

Considerable difficulty was experienced in securing a sample of the bark, but through the kindness of Mr. G. J. Luhn, of Charleston, South Carolina, a small quantity was obtained, together with several leaves and a cluster of fruit. The bark was in quills about two inches in length, from $\frac{1}{16}$ to $\frac{1}{8}$ inch in thickness; externally of an ash gray color, and somewhat warty; internally brownish white, of a distinctly bitter taste, and breaking with a short corky fracture.

A portion of the bark was exhausted by repeated digestion, with

water acidulated with hydrochloric acid; but the acid infusion failed to give any reaction for alkaloids when tested with Mayer's test, picric acid, or phospho-molybdic acid. On concentrating a portion of this solution numerous crystals separated; they were boiled with a solution of sodium carbonate and filtered, the filtrate neutralized gave a precipitate with calcium chloride indicating oxalic acid. The insoluble residue was dissolved in acetic acid and tested with ammonium oxalate with which it gave a precipitate indicating that the crystals were calcium oxalate.

Seventy-five grams of the bark in very fine powder were submitted to the action of petroleum benzin (which had previously been redistilled) until it was thoroughly exhausted. On distilling off the benzin a greenish, wax-like substance remained; this was treated with acidulated water (HCl), to which it yielded nothing, giving no reactions when tested for alkaloids. It was next treated with eighty per cent. alcohol, which extracted a small quantity of a yellow resinous body, soluble in ether. The residue consisted of a waxy substance associated with a small amount of chlorophyll. Fixed and volatile oils were found to be absent.

Alcoholic Extract.—The powdered bark from the benzin operation was kept at a temperature of 100° C. until all traces of benzin had disappeared, was then thoroughly exhausted with eighty per cent. alcohol and the tincture distilled; the concentrated liquid was precipitated by an alcoholic solution of normal lead acetate, and the filtrate freed from lead by hydrogen sulphide concentrated and allowed to stand, nothing separating out; on dilution with water a slight precipitate was formed, which on agitating with ether was dissolved, and on evaporation yielded a dark brown resinous body of a slight taste, and soluble in chloroform and bisulphide of carbon.

The aqueous extract failed to give any reaction for alkaloids when tested with picric acid, phospho-molybdic acid and Mayer's test. The remaining aqueous liquid was precipitated by triplumbic acetate, the filtrate was again freed from lead by hydrogen sulphide and concentrated; on allowing it to stand a light brown, distinctly crystalline substance was deposited, weighing about 0·15 grm., having a very bitter taste similar to that of the bark very much concentrated. It failed to reduce Fehling's solution until boiled with dilute sulphuric acid, and it was entirely dissipated by heat. The substance is a glucoside, I think, and I propose for it the name *Pinckneyin.* The precipi-

tate by the triplumbic acetate was suspended in water and freed from lead; on evaporating, a brownish, somewhat bitter extractive was obtained.

The plumbic acetate precipitate was suspended in eighty per cent. alcohol, freed from lead by hydrogen sulphide, concentrated, treated with water, allowed to stand some time, and the resulting precipitate collected, well washed and dissolved in ether, which left on evaporation a light yellow mass, capable of being powdered; its alcoholic solution was very astringent, and was precipitated, giving a bluish green by ferric chloride. The aqueous solution gave, with ferric chloride, a beautiful emerald green color, changed to a wine red by sodium carbonate, was not precipitated by tartar emetic, not precipitated or colored by ferrous sulphate, reduced solution of argentic nitrate, was precipitated by gelatin, and crystallized from dilute alcohol, resembling caffeotannic acid.

Aqueous Extract.—The bark from the alcohol operation was macerated with water and expressed, the liquid gave a copious precipitate with alcohol, which consisted of gum combined with brown coloring matter. On boiling a portion of the exhausted bark with water, the solution gave a blue coloration after cooling with a solution of iodine. One grm. of the bark (air-dry?) on incineration yielded ·09 grm. = 9 per cent. of ash, consisting of potassium, sodium, calcium and magnesium combined as chlorides, carbonates and phosphates.

In the "American Journal Pharmacy," February 1881, p. 981, it is stated that Dr. Farr claimed to have detected cinchonine in pinckneya, but from my analysis I am led to think this incorrect, as I failed to discover the slightest trace of alkaloid. Owing to the limited supply of bark at my disposal I was unable to make as complete an analysis as the subject deserves.

Oil of Gaultheria in Rheumatism.—Dr. H. H. Seelye reports the results obtained from oil of gaultheria given in 118 cases of acute articular rheumatism. It can be administered in capsules, alone or with salicylate of sodium, or in soda-water, but the preferred method was in an emulsion in glycerin and water. From 10 to 20 minims were given every two hours during the day, and at intervals of three hours during the night. All forms of rheumatic pain seemed remarkably influenced, but its effect was most marked in acute inflammatory cases. The tendency to cardiac complications seemed not to be increased. The success was so gratifying that further trial of the remedy was strongly urged.—*N. Y. Med. Jour.*, Nov. 8, 1884; *Med. Times.*

RHODODENDRON MAXIMUM, LINNÉ.

(GREAT LAUREL.)

Natural Order, Ericaceæ; sub-order, Ericineæ; tribe, Rhodoreæ.

BY GUSTAV FRANK KUEHNEL, PH.G.

From an Inaugural Essay.

This plant is indigenous to the United States from Maine to Ohio, but chiefly in the mountainous parts of Pennsylvania, and southward along shaded water courses in damp, deep woods; it is a shrub or tree, 6 to 20 feet high, with handsome flowers, the corolla being bell-shaped, an inch broad, of a pale rose color, or nearly white, greenish in the throat on the upper side, and yellow or reddish spotted. The leaves are from 4 to 10 inches long, evergreen, coriaceous, alternate, elliptical oblong, or lance oblong, acute, narrowed towards the base, very smooth, unequal at the base, and with an entire, somewhat revolute, margin, near which the anastomosing veins form one or two distinct wavy lines. A quantity of the leaves were collected for me about the middle of August by Mr. Henry C. C. Maisch, a fellow-student and classmate, in the neighborhood of Cresson Springs, Pa. These were carefully dried, remote from heat and direct rays of the sun, powdered, and subjected to an examination which resulted in isolating the three constituents, according to Prof. Maisch, apparently characteristic for coriaceous leaves of ericaceous plants, viz., arbutin, ericolin and ursone; besides these principles, tannin, gallic acid, resin, wax, albumen, coloring matter and a trace of volatile oil were observed.

A portion of the powdered drug was subjected successively to the treatment of petroleum spirit, ether and alcohol, according to Dragendorff.

The solution in petroleum spirit was evaporated at the ordinary temperature; towards the close of the operation a pungent, peculiar odor, slightly irritating, was perceptible, possibly due to a little volatile oil; a soft, semi-solid, waxy mass, of a peculiar resinous odor, was left as a residue.

The etherial liquid was allowed to spontaneously evaporate at the ordinary temperature, and the resulting residue was treated with water and filtered. The filtrate was found to contain gallic acid, by treating with acetic ether, separating and evaporating, when crystals were left which in solution darkened upon addition of solution of iron salt, but on being heated the color vanished; the liquid gave no precipitate with solution of gelatin.

The residue on the filter, after treating the etherial extract with water, was composed chiefly of resin, associated with chlorophyll and other coloring matter.

The alcoholic tincture obtained by macerating the powdered leaves which had been previously exhausted by petroleum spirit and ether was evaporated to an extract, which was then treated with water and filtered.

The residue left on the filter was well washed and dissolved in hot alcohol, which on cooling deposited an apparently amorphous mass, ursone; upon redissolving in alcohol, microscopic needles were obtained, which upon addition of sulphuric acid turned black, reddening the acid, and became yellow with nitric acid, giving off nitrous acid fumes.

The aqueous filtrate was concentrated, treated with acetate of lead, filtered, the filtrate freed from lead by sulphuretted hydrogen, concentrated to a syrupy consistence, again diluted somewhat, and treated with animal charcoal, then concentrated and set aside, when a deposit of acicular crystals was obtained, which proved to be arbutin. An alkaline solution of the crystals gave the sky-blue color with phosphomolybdic acid. Sulphuric acid dissolved them without change of color, but nitric acid turned yellow, with the evolution of nitrous acid fumes.

The precipitate obtained with lead acetate was suspended in water, the lead removed by sulphuretted hydrogen, the filtrate heated to expel excess of sulphuretted hydrogen, and treated with solution of gelatin, when a bulky precipitate was obtained, which, after washing with water, became black on the addition of an iron salt, thus showing it to be tannin.

A second portion of the leaves was treated with water, and the infusion boiled and strained, leaving a flocculent residue of albumen on the strainer. The clear liquid was then concentrated and treated with solution of acetate of lead, the precipitate separated by a filter, and the filtrate freed from lead by sulphuretted hydrogen; the filtrate was heated to expel excess of sulphuretted hydrogen, treated with animal charcoal to remove coloring matter, concentrated, and set aside, when crystals of arbutin were deposited, showing the reactions mentioned above.

The lead precipitates contained tannin and gallic acid, and some arbutin was extracted from the sulphide of lead, and obtained in crystals. The mother-liquors of arbutin seem to contain ericolin.

HOP EXTRACT.

By Wayne B. Bissell, Ph.G.

From an inaugural essay.

In discussing this subject the main object of the writer will be to bring to notice an extract of Hops made by an entirely new processs and to compare that product with one made by myself, according to the directions given in the Dispensatory.

A very fine sample of late hops, which appeared rich in lupulin, was exhausted as thoroughly as possible with pure alcohol by percolation. The drug was then boiled in water for one hour, strained and washed. The alcoholic and watery extracts were evaporated at a very low temperature to a thick syrup and then mixed, and further evaporation carried on by means of a water bath until a product of nearly pilular consistence was obtained, in which condition the patent extract was. The product thus obtained, contained the aroma of the hop which is very easily destroyed by a high heat.

As far as could be learned, the process by which the patent extract is made on a very large scale is as follows:

The hops taken from the bale are run through a machine, which separates the scales from the axis without breaking them much. They are now placed in a large wire cage rather loosely, and three of these cages are run into an immense boiler or "extractor" as it is called, which holds about six hundred pounds of the drug. A heavy door then is shut and barred, making everything secure. About three hundred barrels of gasoline are now pumped in by the engine, when, by means of a steam coil, heat is applied until a pressure of one hundred pounds to the square inch has been attained. The object of this high pressure is to break or crush the little glands called lupulin, which contain the valuable principle, this being taken up by the hot gasoline. As soon as the above pressure has been attained, the steam is shut off and as the heat decreases, the hot gasoline holding the extract in solution is drawn off gradually into a large boiler or tank, and as it gradually cools, the extract settles to the bottom and the gasoline rising to the top is removed and used over again on a fresh portion of hops. In the meanwhile the extract and gasoline remaining in the extractor, have been completely washed out by super-heated steam and both separated as in the former case, so there is but very little waste of

menstruum. The extract in the boiler on cooling to a certain temperature, is drawn off and subsequently canned, in which condition it will keep for an indefinite period, a great advantage over the hop itself, which at the end of two years is nearly useless. One pound of this extract represents about twelve pounds of choice hops. About two thousand pounds of hops can be exhausted in these works during twenty-four hours. The only use made of this extract at present is in the manufacture of beer, for which purpose it is at present being used to a large extent in Philadelphia and New York, fully supplying the place of the ordinary hop.

On investigation quite a difference was observed between this extract and the one made by myself, the former being of an intense black color, appearing to be more oily, and containing practically no tannin or a mere trace, while in the extract made by myself between 7 per cent. and 8 per cent of tannin was indicated by using a solution of acetate of lead.

The amount of glucose was ascertained by Fehling's solution, and found to be in my extract 12 per cent., but in the patent extract, a little over 16 per cent. During this investigation the writer obtained results more easily from the patent extract than from the extract made by himself.

On exposing the extract made by me to a temperature of 100°C. until it ceased to lose weight, 13 per cent. of volatile matter was expelled, and at 110° C. it lost an additional 9 per cent., becoming quite dry, darker in color, losing its aroma and breaking with little difficulty into small pieces. The patent extract exposed to 100° C. lost only ·05 per cent. in weight and at 110° C., this loss was increased by only an additional ·03 per cent. This high heat seemed to have but very little effect on it, either in changing its color, or destroying its odor.

The effect of different solvents on the two extracts showed a very marked difference. Water dissolved only a very small portion of the extract made by me, leaving a brown residue, which was apparently mostly resin and oil. Alcohol had only a slight effect, but dilute alcohol took up more. All of the ordinary solvents were tried, and none of them completely dissolved this extract.

The patent extract was found to be practically insoluble in water, and also in cold alcohol, but hot alcohol held it in solution as did also benzin. It is more soluble in ether and completely soluble in chloro-

form. It has a very strong and rather unpleasant odor, and its taste is exceedingly bitter. A further point of interest concerning this extract is, that when it is being drawn from the storing boiler into large cans, quite frequently small white crystals are seen, but it is impossible almost to separate them. The extract without purification, so as to free it entirely from the gasoline, could not be used internally as it creates nausea, but is quite frequently mixed with sugar and formed into cakes in which condition it is used to some extent.

In conclusion, the writer would extend his thanks to W. A. Lawrence, Superintendent of the works, through whose kindness he obtained the process of manufacture as given above.

SYRUPUS PRUNI VIRGINIANÆ.

By J. George Engler, Ph.G.

From an Inaugural Essay.

The bark from which this syrup is made is obtained from Prunus serotina, and collected in autumn. On the recent shoots it is green or olive brown, polished, and has minute orange dots; afterwards it becomes darker and on the small trunks and larger branches is of a reddish or purplish brown, with scattered, oblong, horizontal dots characteristic of the cherry. Old trunks have a scaly bark not unlike some of the pines.

The wild cherry tree rarely attains a height of more than forty or fifty feet in Massachusetts. According to Dr. Richardson it grows as far north as the Great Slave Lake, in latitude 62°, but only attains the height of about five feet. In Maine it rises to about thirty feet, being seldom more than a foot in diameter. In western New York it grows to a great height and a large size, but along the Ohio river it is seen in its perfection, for it is found from twelve to sixteen feet in circumference and from eighty to one hundred feet high. The trunk is of uniform size and undivided to the height of about twenty-five feet. The wood is of a light red color, growing darker with age, and its medullary rays are very numerous and more closely arranged than those of most other woods. It is especially valuable in cabinet work

and has of late years become very much in demand for fixtures in many pharmacies. The most beautiful portion commonly used is that where the branches begin. The bark is of a pleasant aromatic bitter, leaving, when chewed, an agreeable taste in the mouth.

The U. S. P. process for preparing syrup of wild cherry is unsatisfactory on account of the unstability of the production and its liability to undergo fermentation. The remedy which suggested itself to me was the use of a quantity of either alcohol or glycerin. The object of my experiments has been to obtain a syrup that will remain permanent, under ordinary circumstances, with the smallest amount of these preservatives. To make a just comparison I first made a syrup according to the pharmacopœial formula. This syrup was made March 1st, 1884; it had a rich brownish red color, the characteristic odor of hydrocyanic acid, and a slightly bitter, astringent taste. Placed on a shelf where it was subjected to the ordinary conditions of light and heat of the store, after eight weeks a slight cloudiness was formed, followed by a noticeable amount of precipitate, and fermentation soon began. With this change the syrup began to lose its color, and after nine months had lost all resemblance to a good syrup in color and odor, and it also had a thick fungous growth at the top.

Three syrups were next made in which the glycerin was replaced by alcohol in different proportions, and three in which the quantity of glycerin was increased in different amounts. Those made with alcohol show the following results: Number one, with four drachms of alcohol to the pint, kept almost perfectly for three months, then a slight precipitate began to form, which, after nine months' standing, is quite noticeable; odor and color remain unchanged. Number two, made with one ounce of alcohol, remained unchanged somewhat longer, but a precipitate has formed. The color remains unchanged and the odor is slightly alcoholic. Number three, made with one and a half ounces of alcohol, remained permanent for a still longer time, color unchanged and a stronger alcoholic odor. The result of these three experiments with alcohol as a preservative show that this menstruum in practicable amounts is not satisfactory. The syrups made with increased quantities of glycerin showed the following results: Number four, with two ounces of glycerin to the pint, a bright syrup of beautiful color, and after standing nine months still remains unchanged. Number five, with two and a half ounces, and number six with three ounces

of glycerin to the pint, gave permanent, bright syrups. The syrup was made by the following formula:

Wild Cherry bark	℥v,
Bitter Almond	℥v,
Water	℥xvi,
Glycerin	℥ii,
Sugar	℥xxiv,

Made according to the pharmacopœial method a handsome syrup is obtained, permanent, and having a strong odor and taste of hydrocyanic acid. These results show that glycerin in somewhat increased amounts would make the syrup permanent.

GLEANINGS FROM FOREIGN JOURNALS.

By J. Robert Moechel.

Thorough Extraction of Vegetables.—A considerable quantity of water and sometimes application of heat is necessary for completely extracting tannin and coloring matters from plants. Dr. O. Kohlrausch, of Vienna, claims that a small amount of water is needed, and that very concentrated solutions are obtained at a low temperature, by operating as follows:

The material to be extracted is covered with water, and macerated for some time at a pressure of one atmosphere. The water penetrates the cellular tissue, dissolves the coloring matter, and, by way of diffusion, the water becomes saturated to the same degree as the liquid in the cells. Separating the liquid, and repeating the operation several times, under the same conditions, secures the complete extraction of coloring matter.—*Erfindungen und Erfahrungen, Wien*, i, 1885.

Ergot.—Dr. R. Kobert's interesting investigations show the presence in ergot of three physiologically active bodies—two acids and one base.

I. *Ergotic Acid*, being the principal constituent of the sclerotic acid of Dragendorff and Podwyssotzki. Its isolation depends upon its being precipitated by ammoniacal subacetate of lead.

II. *Sphacelic Acid* (from the old name of ergot, Sphacelia segetum). Its isolation depends upon the insolubility of the free acid in water, and its solubility in alcohol.

III. The alkaloid *Cornutine* is not identical with the crystallized nor with the amorphous ergotinine of Tanret; it is readily soluble in alco-

hol, and is obtained from an alkaline aqueous solution by agitation with ether. This alkaloid is reported as being very poisonous.—*Pharm. Centralhalle*, 1884, p. 607.

Paraldehyd as a Reagent for Caramel, is recommended by Dr. C. Amthor, who finds, that an alcoholic liquid containing caramel (rum, cognac, brandy, wines) gives, on the addition of sufficient paraldehyd, a brown precipitate, and becomes decolorized. Minute quantities of caramel may be detected as follows:

Mix 10 cc. of the liquid in a suitable tall vessel, or white glass medicine bottle, with from 30 to 50 cc. paraldehyd (according to intensity of color) and enough alcohol to obtain a uniform mixture; wine requires about 15 or 20 cc. of alcohol. After 24 hours, caramel will show its presence by a brownish to dark brown sediment, which adheres to the bottom; after washing it with a little absolute alcohol, dissolve the sediment with hot water, filter, and evaporate to 1 cc.; this residue will give an indication of the quantity of caramel present. —*Zeitschrift f. Analyt. Chemie*, 1885.

Sugar in Beet Root.—Girard shows by new assays that the formation of sucrose takes place in the margin of the leaves through the influence of the sunlight. During the night the sugar passes into the root, so that in the morning the leaf margins are free from sucrose, but retain a uniform quantity of reducing sugar.—*Journ. de Fabr. de Sucre*, 1884, pp. 25, 48; *Chemiker Ztg.*, 1885, p. 3.

Mixtura dentrificia.—

Oil of pepper mint (English)	10·0
Oil of anise (French)	4·0
Oil of star anise	4·0
Oil of Ceylon cinnamon	1·0
Oil of rose	0·5
Oil of cloves	2·0
Tincture of ambergris	2·0
Tincture of vanilla	10·0
Tincture of cochineal	25·0
Tincture of logwood	2·0
Tincture of orris root	6·0
Sugar	10·0
Alcohol	1 liter.

Digest for 24 hours, and filter.—*Gaz. Hebdom.; Pharm. Ztg.*, 1885, p. 5.

Paste of Squill as Rat Poison.—Melt in a suitable dish 4 ounces of

lard; add 8 ounces of squill, and a small onion, cut into minute pieces; digest, with continuous stirring, for about 15 minutes, and then mix with an equal quantity of mashed potatoes. When cool, add 20 drops of oil of anise. This paste is said to be very efficient.—*Pharm. Ztg.*, 1885, p. 6.

Ferrous iodide, dissolved in glycerin, does not undergo any alteration. The following formula is suggested by Sylvio Plevani:

Digest 20 Gm. iodine, 10 Gm. card teeth and 30 Gm. water; filter into a porcelain capsule, containing 75 Gm. of glycerin, and evaporate to 100 Gm.

This solution contains 23 Gm. of ferrous iodide, and, since it is miscible in all proportions with water, alcohol and syrups, and may also be incorporated with fats and oils, it is a preparation offering great convenience in dispensing.—*Bollet. Farmaceut.; Pharm. Ztg.*, 1885, p. 9.

Carbolic Acid.—The reddish tint which carbolic acid assumes seems to be frequently, but not always, caused by the presence of traces of iron, as shown by Hager. After purifying a red carbolic acid by distillation, he was not able to find any indication of iron, but concludes that the coloration may have been caused by compounds resembling corallin or tropæolin.—*Pharm. Centralhalle*, 1885, p. 1.

Pomegranate bark, according to Carl Julius Bender, contains but one crystallizable alkaloid and two amorphous bases. He discards the name Pelletierine in favor of "Punicine," and gives a process for the preparation of a stable crystallized sulphate.—*Pharm. Centralhalle*, 1885, p. 6.

Aconitine has a reducing action on salts of silver and mercury, by which it may be recognized, according to Hager.

On dissolving 0·02 or 0·03 Gm. aconitine in 3 to 4 cc. alcohol, and adding a few drops of solution of nitrate of silver, instantaneous reduction takes place, which action may be accelerated by heat. The drops falling into the aconitine solution cause turbidity and a brownish color. More than traces of other salts, especially alkalies, prevent the reduction until after repeated boiling. The scaly aconitine of commerce seems to have been obtained by spreading an alcoholic solution on glass plates.—*Pharm. Centralhalle*, 1885, p. 6.

Reaction of Chloral Hydrate.—If calcium sulphydrate, $Ca(SH)_2$, is added to a solution of chloral hydrate, the liquid assumes a red color. The reaction is less delicate, but still distinct, if H_2S and then CaHO

is added to the chloral hydrate, and after a minute the liquid assumes a pink color.—*Arch. d. Pharm.*, vol. 223, p. 26; *Ph. Centralh.*, 1885, p. 6.

Antiseptic Vinegar, in place of "Vinaigre de Toilette."—

℞	Aetheris acetici	8·0
	Acid. acetic. conc	120·0
	Tinct. eucalypti globuli	60·0
	Aquæ coloniense	960·0

—*Der Fortschritt*, No. 2; *Ph. Centralhalle*, 1885, p. 6.

Vapor of Glycerin for Cough.—M. Trastour has employed, with great advantage, the vapor of glycerin for alleviating distressing or frequent cough, irritation of the thoat, etc.

About 50 or 60 Gm. of glycerin are heated in a porcelain capsule, and the vapor, which is copiously disengaged, is breathed by the sufferer. Carbolic acid dissolved in glycerin may also be employed.—*Gaz. Méd. de Nantes.*

Detection of Copper and Lead in Wine.—Hager recommends mixing the suspected wine with ¼ or ½ volume of clear liquor sodæ, when the mixture should remain clear even if boiled; a colored turbidity would indicate the probable presence of copper. Put 6 cc. of the clear mixture in a test-tube and introduce a piece of tin foil, which should be entirely covered by the liquid; warm in a water-bath for about ½ or 1 hour. If the wine be free from lead and copper, the tin foil will remain glossy; slight traces of these metals cause the tin foil to lose its lustre, and to become grayish; in the presence of more than traces of these metals the tin foil will become dark gray to dark grayish black (lead); dark steel colored, brown or brownish black (copper). Boiling will accelerate the action. Presence of zinc or arsenic will not interfere with the above reaction.—*Ph. Centralhalle*, No. 8, 1885.

A delicate test for nitric acid is recommended by Prof. Uffelmann: Add to a small piece of diphenylamine, of about the size of half a lentil, placed in a porcelain capsule, 1·5 cc. H_2SO_4, which must be absolutely free from NO_2 and HNO_3; stir with a glass rod until a very pale pink color is produced, and add 3 or 4 drops of the liquid to be tested, on the border of the capsule. Much HNO_3 will instantaneously cause the appearance of a bluish line, extending like a cloud. Slight traces of HNO_3 give that line, after a short while, mostly within a minute, and this line also extends and becomes more intense. The

proportions given are essential to success; the test is more delicate than that with brucine.—*Pharm. Ztg.*, No. 14.

Syrup of Pineapple.—Cut 5 kilos of selected pineapples in small pieces, transfer into a bottle, add 5 kilos each of white wine and water, and macerate at a medium temperature for several days. Boil 30 kilos of sugar with 20 kilos of water, add the strained infusion, heat to ebullition, and strain through flannel.

Syrup of Apricot.—Digest, for six days, 5 kilos each of white wine, water and ripe apricots, freed from stones and cut into small pieces; strain, press very gently, and add to the hot syrup, prepared as above of 40 kilos of sugar and 30 kilos of water. When cold, add 200 Gm. of artificial essence of apricots.—*Erfind. und Erfah.*

Shoe Blacking.—Mix 100 parts bone black, 50 parts glycerin, 5 parts oil and 10 parts of vinegar. This blacking is said to give excellent shine, and to keep the leather smooth and soft.

Transparent Glue for Porcelain.— Dissolve 75 Gm. caoutchouc, in small pieces, in 60 Gm. of chloroform; add 15 Gm. of mastic, and dissolve without heat.—*Chemiker Ztg.*, No. 14, 1885, p. 254; *Nature*, 1884, xii, p. 587.

REACTIONS WITH CARBON AND SOME OF ITS COMPOUNDS.

By G. Gore.

When white or red phosphorus, or powdered arsenic or antimony or sodium, are added to fused potassium cyanide; or when aluminium or sodium phosphide, or a mixture of sodium phosphide with zinc, is added to fused potassium and sodium carbonates; or when sodium carbonate is decomposed at a low red heat by phosphorus vapor; or when a mixture of red phosphorus and ammonium carbonate is dropped into a red-hot porcelain crucible, a black substance separates, which in some cases is found to be carbon. Carbon is also obtained when coal-gas is passed over red-hot finely powdered ferric oxide, or over just fused argentic fluoride or chloride, or over chloride of lead or copper. Arsenic and antimony do not visibly decompose fused sodium and potassium carbonates; neither is carbon set free when ammonium carbonate is added to fused sodium; nor when coal-gas is passed over fused cadmium chloride or silver iodide; nor in several experiments wherein numerous hydrocarbons, in various solvents, were exposed to metals and metallic couples. Several unsuccessful attempts at deoxi-

dising carbonic anhydride are also described along with many experiments wherein many substances alone and in contact were immersed in various solutions of metallic salts containing carbon in combination, and in these solutions when exposed to carboniferous vapors, but in all cases without any deposition of carbon. The chlorides of carbon proved equally useless as sources of carbon, even resisting the influence of potassium, which, however, formed an alkaline salt with carbon tetrachloride; potassium or sodium, dissolved in anhydrous liquid ammonia at 60° F., behaved in a similar manner with carbon bromide and sulphide and with anhydrous sodium carbonate or formate, or ammonium oxalate. On passing dry ammonia gas into liquid carbon dichloride containing potassium, gas was evolved, and a red powder formed; with naphtha instead of the chloride, the potassium only became red. Carbon is insoluble in anhydrous liquid cyanogen, sulphuric chloride, phosphorus trichloride, antimony pentachloride, anhydrous liquid hydrofluoric and hydrochloric acids; chlorides of carbon and bisulphide of carbon were also found to be insoluble in the last two acids, but they are soluble in liquid cyanogen. Many experiments with carbon bisulphide are described; for example, when silver and platinum in contact are immersed in it, after some time the silver blackens; in the same way lead and mercury yield a black powder soluble in nitric acid. Thallium also blackens, but no action could be observed with tin, or magnesium and platinum, or with boron fluoride; tin tetrachloride, thallium chloride and cyanogen are dissolved by it, and it precipitates mercuric chloride from its solution in ether. The solutions of sulphur and phosphrous in carbon bisulphide give no reaction when exposed in an atmosphere of carbonic anhydride; zinc remains bright in the sulphur solution and potassium and platinum in contact cause no free carbon to separate from it; aluminium and magnesium become dull, but are not corroded by prolonged exposure in the phosphorus solution. When a solution of silver nitrate with a piece of platinum partly immersed in it was exposed to carbon bisulphide vapor continuously for seven weeks, all the silver was precipitated; magnesium, aluminium or silver partly immersed in water exposed to the same vapor, were unaltered; when, however, the silver was in contact with platinum, the liquid became dark and the silver above it blackened. A liquid which dissolved selenium was obtained by passing the vapor of selenium over charcoal powder kept at a full red heat.—*Chem. News*, vol. 50, pp. 124–126; *Jour. Chem. Soc.* 1885, p. 119.

NEUTRAL OLEATE OF MERCURY.[1]

By Charles R. C. Tichborne, L.L.D., F.I.C., Etc.

Attempts have been made to make the mercurial oleates by double decomposition, but my experience is that it is not attended with much success. This is in great measure owing to the fact that when the salts (let us say mercuric chloride and oleate of sodium) in the proportions to form the *neutral* oleate are brought together, very little of the oleate is formed, and it is next to impossible to work the product properly. If we double or halve the equivalent of oleic acid so as to get an acid or basic salt the product is much larger. It is the acid oleate which has generally been formed in the double decomposition process.

Assuming that oleic acid is what is termed a monobasic acid, the neutral mercuric oleate should have the following composition:

$$\dot{H}g2C_{18}H_{33}O_2.$$

We find that mercuric oxide (either the red or yellow oxide) dissolves in the proportions requisite to produce a neutral salt forming a colorless and fairly homogeneous mass. If this be placed under the microscope, however, indications of the separated water may be perceived. This water, which is produced by the decomposition, has, I think, frequently been lost sight of in considering the oleates. The reaction is as follows:

$$HgO+2C_{18}H_{34}O_2=Hg2C_{18}H_{33}O_2,H_2O.$$

If we allow oleate of mercury to stand, however, some considerable time, this water seems to be assimilated, and a hydrate is formed. The oleate pectises, and the colloid oleate, if diluted with vaseline and placed under the microscope, is seen in jelly-like masses disseminated through the element. It is mixed with some little difficulty. If the oleate is gradually heated upon a water-bath to 100° C., the water is very slowly given off, and long before the theoretical quantity is lost, the oleate begins to decompose. The acid being oxidized and metallic mercury deposited, if this reaction be pushed to its ultimate results, a dark-colored liquid oil is produced and metallic mercury. The fusing point of mercuric oleate is two or three degrees above the boiling point of water.

[1] From the "Medical Press," September 24, 1884.

It begins to slowly decompose at this temperature, therefore the mercuric oleate should be formed in the cold. No heat should be used, and an excess of oleic acid is not only unnecessary, but detrimental to its keeping properties. Free oleic acid has a tendency to change to an irritating oxy-oleic acid, which it does at the expense of the mercuric oxide, as evidenced by the production of the metallic mercury. It may be made either from the red or yellow mercuric oxide, and although the yellow is specified in the existing formula, finely levigated red oxide will be found preferable, using equal proportions, viz., $2\frac{1}{2}$ parts of mercuric oxide for every 5 parts of the best commercial oleic acid. It does take a little trouble to form the mercuric oleate by the direct action of the oxide upon the acid, but if we possess machinery the process is rendered comparatively easy. It would be almost impossible to make this preparation were it not that, as already explained, mercuric oxide forms both basic and acid compounds. This fact shortens the process, which consists really towards its conclusion in getting a semi-solid substance (the acid oleate first formed) to act chemically upon the remaining oxide.

The keeping and non-irritant properties of the resulting *neutral* oleate will repay the trouble spent in the manipulation.—*Pharm. Jour. and Trans.*, January 17, 1885, p. 576.

Pilocarpus.—Dr. Sidney Thompson has for several years been treating erysipelas locally with the fluid extract of jaborandi, and usually in the following prescription:

℞	Jaborandi fluid extract	24	grams
	Glycerin	4	"
	Laudanum	4	"
M.	Sig. Paint with a feather every four hours.		

The glycerin is necessary, as the jaborandi has a tendency to produce a desquamation if used alone; the laudanum is added simply to relieve pain. *Therapeutic Gazette*, Nov., 1884, p. 504.

Dr. W. W. Claybaugh has used a similar mixture, increasing the laudanum and glycerin each to 12 grams, and reports favorable results in erisypelas, in inflammation caused by croton oil, and in severe scalding of the hand by a boiling liquid; in the latter case the inflammatory action was totally prevented.—*Med. and Surg. Rep.*, Feb. 7, 1885, p. 188.

THE DEVELOPMENT OF COLOR IN LIQUOR CALCIS SACCHARATUS.[1]

By John R. Hill.

The gradual development of a yellowish-brown color in the official liquor calcis saccharatus attracted my attention a few years ago. I did not at that time attempt to ascertain the cause of the phenomenon, my inquiries being rather directed to the point of ascertaining whether or not the coloration was accompanied by any deterioration in alkalinity. With this view I made estimation of freshly prepared liquor and of the same after being allowed to stand until considerably colored. On comparing the two results, they were found to indicate only a very slight deficiency in the colored liquor. It was, therefore, concluded that, practically the coloration was of very little consequence.

The subject was again brought under my notice recently by a request to furnish an answer to the query, What causes the coloration of liquor calcis saccharatus, and how may it be prevented? Being at the time engaged in the preparation of our usual stock quantity of the liquor, I embraced the opportunity of making a few observations.

The British Pharmacopœia directs the clear solution to be decanted from the sediment; but it has been my usual practice to filter off after allowing to stand for twelve hours. Following the latter method, the clear liquid which passes rapidly through the filter was kept separate. The sedimentary portion, of course, filtered more slowly, and on comparing the two liquids I was a little surprised to find that the latter was considerably deeper in color—a fact which is explained further on. Squire states that the fresh liquor is colorless, but gradually acquires a brownish color. Neligan states that it is transparent, but possesses a slight yellowish tint. The latter appears to be the more correct statement, my experience being that from the first, the liquor is of a very pale straw color.

In attempting to answer the above query, the first thing done was to ascertain if there were any published results on the subject; but a rapid glance through all the availing literature goes to show that the point has not been previously investigated. A series of experiments were then made to determine the respective effects of the three agencies —light, heat and exposure to the atmosphere.

[1] Read at a meeting of the North British Branch of the Pharmaceutical Society, January 14, 1885.

1st. *Action of Light.*—To ascertain the effect of light, a bottle was filled quite full, securely corked, and exposed to direct sunlight for three weeks. A second bottle similarly filled and corked was kept during the same period in total darkness. On comparing the two liquids at the end of this time, hardly any development of color had taken place, and the difference between the two was barely perceptible, the one exposed to sunlight being, if anything the lighter of the two. It would, therefore, appear that light does not cause the coloration.

2d. *Action of Heat.*—A portion of the liquor was then gradually heated to the boiling point. This causes the separation of a bulky precipitate consisting of a compound having the formula $(CaO)_3C_{12}H_{22}O_{11}$, which immediately re-dissolves on cooling, the resulting solution being almost absolutely colorless. This seems to indicate that heat is not the cause of the coloration. I am inclined to think that the boiled liquor is chemically different from the original, the union between the lime and the sugar being probably more intimate. Wood and Bache give a formula for syrup of lime prepared by triturating 400 grs. of well-burned lime with 3200 grs. of cane sugar, adding to this 8 oz. of boiling water, boiling for five minutes and filtering. It is possible that such a preparation would be less liable to colorize than the British Pharmacopœia preparation. It may be worth noting here that in old highly colored samples of liq. calcis sacch. the precipitate produced on boiling was only very slowly and not completely re-dissolved on cooling, the quantity of insoluble matter being apparently proportionate to the depth of color.

3d. *Action of Air.*—Exposure of the liquor to the action of the air was next investigated. A 1-ounce bottle was half filled with the liquor and allowed to stand in direct sunlight for three weeks, being repeatedly shaken and uncorked during the interval. Under these circumstances coloration gradually took place, and on comparison with a similar bottle kept in the same position, but quite full and well corked, the latter was found to be practically unchanged, while the former was of a decided yellow color, tending to brown, but still quite free from deposit. The same experiment was repeated with bottles kept in total darkness, and the results were precisely similar. I observed that some of the liquor had exuded by the cork from the full bottle kept in the dark and formed a solid crust, which was transparent, of a deep brownish-yellow color, very glutinous, having a strong styptic taste and an alkaline reaction. A 6-ounce bottle was filled two-thirds full and

allowed to stand undisturbed for a fortnight. On examination at the end of that period, it was found that on the surface of the liquid, where it was subjected to the influence of the air, there was a highly colored stratum about 1 inch deep, while the rest of the liquor remained unaltered.

These experiments appear to prove that the development of color in liq. calcis sacch. is due entirely to exposure to atmospheric air, and that light and heat are not concerned in the action. This explains the fact, already mentioned, that the second portion of the filtrate, which was longer exposed to the air, was more highly colored. I have made an extensive series of experiments with a view to determine the nature of the chemical changes to which the coloration is due, but owing to the very limited time at my disposal, these are very incomplete and inconclusive, and would require considerable verification. With that proviso I give a few results which may be taken for what they are worth.

It is well known that a solution of cane sugar when allowed to stand becomes partially changed into grape sugar and levulose according to the following equation—

$$C_{12}H_{22}O_{11}+H_2O=C_6H_{12}O_6+C_6H_{12}O_6.$$

By the action of the alkalies, grape sugar is rapidly decomposed with production of a deep brown color, and my first idea was that this reaction explained the coloration. A portion of the liquor was precipitated by passing a stream of carbonic acid gas which, by the way, only slowly separates the lime. The whole of the coloring matter was thus precipitated, and on testing the clear solution with Fehling's reagent no reduction took place, indicating absence of grape sugar. On this point I have more to say presently. My next idea was that possibly the coloration might be due to production of amorphous sugar which, as is well known, gives the yellowish-brown tint to the mother liquor or golden syrup of the sugar refineries. To test this theory, a small proportion of golden syrup was added to a portion of the fresh liquor, which was allowed to stand for some time and then precipitated by a stream of CO_2. Under these circumstances the coloring matter was not precipitated, and the amorphous sugar theory was therefore abandoned. On reconsidering my first theory it occurred to me that the reason why I did not discover grape sugar in the liquor, was that it had been decomposed by the alkaline solution as rapidly as it had been formed. Two grains of impure grape sugar were added to 1 ounce of

freshly made liq. calcis sacch., and after standing for twelve hours, the solution was found to be more highly colored than a sample of liquor which had been made for eighteen months and kept under conditions favorable to the development of color. In a similar experiment with pure grape sugar, the liquor, also acquired in a short time a distinct yellow color, but not nearly to the same extent as with impure grape sugar. The next point to be determined was an explanation of the relationship between exposure to air and the development of color in accordance with the grape sugar theory. It was found that after boiling and filtration the clear liquid from which the lime had been precipitated by CO_2 still contained some lime in solution which could not be precipitated by CO_2, and was apparently combined with an organic acid. This acid might be readily isolated by acidifying with H_2SO_4 and distilling, but time would not allow of this being done, and consequently my statements in regard to it are mainly speculative and suggestive.

The fact that contact with the air is necessary for the development of color, in the liquor points to the conclusion that it is due to some process of oxidation. It seems probable that grape sugar and an organic acid are produced, and I find that one molecule of cane sugar and three atoms of oxygen give one molecule of grape sugar and one molecule of saccharic acid, according to the following equation—

$$C_{12}H_{22}O_{11}+O_3=C_6H_{12}O_6+C_6H_{10}O_8.$$

Then grape sugar, in contact with solution of lime, has been found to be gradually changed into glucic acid. By absorption of oxygen from the atmosphere glucic acid becomes transformed into aploglucic acid, which is an amorphous substance having a deep brown color, and this may be the cause of the coloration.

I have observed that the deposit found in liq. calcis sacch. which has stood for some time does not effervesce, or only very slightly on the addition of hydrochloric acid. This fact may be explained by the theory that the cane sugar is tranformed in the usual way into grape sugar and levulose. Levulose is known to form an insoluble lime compound, which may constitute the deposit in question, the subsequent decomposition of the grape sugar by the lime producing the color. Formic acid is known to be produced in solutions of sugar in contact with air and the addition of ferric chloride to the clear liquid from which the lime had been precipitated certainly gave the red

coloration characteristic of the salts of formic acid. I am inclined to believe that the first step in the development of color is the formation of grape sugar, but beyond that point these speculations are, I feel, very problematical, but may assist in the further elucidation of the subject. It was found that the lime was entirely precipitated from freshly made liquor by CO_2, with the exception of a small proportion due to the presence of chloride in the calcic hydrate, thus supporting the theory that the lime which is not precipitated from old samples is held in solution by an acid produced by the oxidation of the sugar. A very small proportion of grape sugar is sufficient to produce all the color found in samples kept as long as eighteen months, and this accounts for the very slight difference found to exist between the alkalinity of colorless and colored samples. From a practical point of view, therefore, the coloration is not of any great consequence.

With regard to the latter part of the query, namely, How may the development of color be prevented?

This may be the most effectually done by storing the liquor in bottles quite full and securely corked. This investigation goes to show that to prevent coloration the liquor *should not* be filtered, but decanted or syphoned off, as directed in the British Pharmacopœia. I observed that no less authorities than Roscoe and Schorlemmer erroneously state that the solution should be filtered. The liquor can be very readily prepared, and coloration will also be prevented by avoiding the error of making too large a quantity at a time. So far as I know, liquor which has become colored cannot be decolorized. I have tried digestion with animal charcoal, but without effect.—*Pharm. Jour. and Trans.*, January 24, 1885, p. 595.

EUCHLORINE AS A DISINFECTANT.—T. Hatfield Walker, L. R. C. P., in the "Lancet," says: Each molecule of *euchlorine* sets free four atoms of oxygen in the nascent condition, and is probably the most powerful of its class. The free chlorine that it contains doubtless, also, contributes to its efficacy. Euchlorine is a mixture of free chlorine, or chlorine very loosely combined with chlorous oxide, and is prepared by pouring strong hydrochloric acid on potassium chlorate and applying a gentle heat. He placed a small basin containing the chlorate in a large one full of boiling water, and on pouring in the hydrochloric acid the euchlorine was freely given off. The practical experience of several years' use in all cases of fever fully bore out the theoretical experiments, that in euchlorine we have a cheap, simple and effective disinfectant.—*Quarterly Therap. Review*, Jan., 1885.

THE DETERMINATION OF ETHYL NITRITE IN THE SPIRIT OF NITROUS ETHER AND KINDRED PREPARATIONS.

By Alfred H. Allen.

During many months past I have been engaged at intervals on a series of experiments with a view of estimating the proportion of ethyl nitrite and other nitrous compounds contained in sweet spirit of nitre. In the course of the investigation I have tried nearly all the published methods of assay,[1] and have obtained results of which the following description is an epitome:

The British Pharmacopœia test for the presence of nitrous compounds in the spirit of nitrous ether is a satisfactory one from a qualitative point of view, but it can be applied in a more advantageous manner than is directed in the British Pharmacopœia by mixing the sample with a strong aqueous solution of ferrous sulphate, and then pouring concentrated sulphuric acid down the side of the tube in such a manner as not to mix with the lighter liquid. A deep brown zone will be produced at the junction of the two strata, which, in the case of good samples, becomes intensified by cautious agitation.

Many samples of spirit of nitrous ether give a brown color with ferrous solution before the addition of acid, but the coloration is

[1] The literature of spirit of nitrous ether is somewhat extensive. The following is a list of references to it in comparatively recent volumes of the "Pharmaceutical Journal:"

T. Redwood [3], viii, 377, 455.
J. Attfield [3], viii, 454.
F. W. Rimmington [3], viii, 341, 362, 377; x, 41, 220.
J. Williams [3], viii, 441, 453.
W. Smeeton [3], x, 21.
A. Dupré [3], x, 93.
J. Muter [3], x, 94.
W. Pollard [3], x, 100.
J. F. Eykman [3], xiii, 63.
W. H. Symons [3], xiv, 281.
U. S. and German Preparations [3], xiv, 101.
D. J. Leech [3], xiv, 322.
A. C. Abraham [3], xiv, 390, 876, 915.
P. MacEwan [3], xiv, 817, 826, 896, 936.
D. B. Dott [3], xiv, 819, 826, 895; xv, 200, 492, 592.
T. S. Dymond [3], xv, 101.

always considerably enhanced by the sulphuric acid, and strong acid is far preferable to dilute.

I have tried the experiment of shaking a sample of spirit of nitrous ether with neutral sodium carbonate, filtering, and testing the filtrate with a solution of ferrous sulphate without adding acid. No reaction was at first produced, but the brown color gradually developed, and after a few minutes was very intense.

The iron test has the great advantage of really indicating the presence of nitrous compounds instead of leaving their existence to be inferred from some such fallacious reaction as the decoloration of permanganate. No doubt the permanganate processes of assaying spirit of nitrous ether are capable of giving useful comparative results in the case of samples of good quality, but when applied to inferior samples, or to specimens containing much aldehyde (such as the London Pharmacopœia preparation), the indications are utterly worthless and misleading, and the results should on no account be expressed in terms of nitrous ether.[1]

The well known process of Prof. J. F. Eykman for assaying spirit of nitrous ether is practically a quantitative application of the iron reaction, but, instead of relying on the depth of the brown coloration, the nitric oxide gas evolved is collected and measured. Eykman's process has given excellent results in the hands of Messrs. P. MacEwan and F. S. Dymond, and Mr. D. B. Dott has confirmed the general accuracy of the process, and has found the results very constant, even when the conditions of the experiment are varied. Their reports have been confirmed in the main by an extensive experience of its capabilities in my own laboratory, where the accuracy of the process has been fully verified when a known quantity of pure sodium nitrite (made from silver nitrite) is employed. With solutions of ethyl nitrite several sources of error exist, which tend to cause the method to give results somewhat below the truth. The chief cause of error is probably incomplete reaction, but the solubility of nitric oxide in aqueous liquids also affects the results. The loss from the latter cause is reduced to a minimum if a nitrometer be employed instead of the gas being caused to bubble up through a solution of soda. Probably still

[1] A sample of sweet spirit of nitre, which gave only faint indications of nitrous compounds when independently examined by the iron test by four different chemists, was reported by another chemist to contain 1·3 per cent. of nitrous ether, as the result of an analysis by Muter's modification of the permanganate process.

closer results might be obtained by saturating the soda solution with common salt.

Although, up to the present time, Eykman's process has been rightly regarded as that furnishing the nearest approach to accuracy in the assay of spirit of nitrous ether and kindred preparations for ethyl nitrite, I believe the following method will practically replace it in the future. It suggested itself to me when attempting to estimate ethyl nitrite by the process of Mr. D. B. Dott ("Pharmaceutical Journal," [3], xv, 200, 492, 592), which consists in treating the sample with an acidulated solution of potassium iodide, and estimating the nitrous compounds from the amount of iodine liberated, as ascertained by titration with decinormal solution of sodium thiosulphate. It is evident that the ethyl nitrite may be estimated either from the amount of iodine set free or from the volume of nitric oxide evolved in the reaction, the former being Dott's method, and the latter the one to which I now desire to call attention.

The assay might no doubt be made in an apparatus similar to that employed by Eykman, but I have found the following method of manipulation far more simple and satisfactory in every sense. It is the outcome of a large number of experiments made to test the constancy of the results under different conditions of operating. A nitrometer should be filled with strong brine and 5 cc. of the sample to be tested should then be placed in the cup of the nitrometer, and allowed to enter through the tap, taking care that no air gets in at the same time. Five cc. of a strong solution of potassium iodide is next allowed to enter, and this is followed by about 5 cc. of dilute sulphuric acid. Effervescence immediately ensues, and if the tube be vigorously agitated at intervals,[1] the reaction is complete in five minutes, when the level of the liquid in the two limbs of the nitrometer is adjusted, and the volume of nitric oxide gas read off. If the volume of gas evolved be small, another 5 cc. of the sample should be let into the nitrometer, and the agitation repeated. The calculation is the same as in Eykman's process, the reaction being:

$$(C_2H_5)NO_2 + KI + H_2SO_4 = (C_2H_5)OH + KHSO_4 + I + NO.$$

Thus, 75 parts by weight of ethyl nitrite evolve 30 of nitric oxide

[1] This should be effected by holding the tapped tube vertically and agitating the contents by a transverse motion. In this way the reaction is readily confined to the upper part of the liquid in the closed side of the nitrometer.

gas. When strictly accurate results are not required, the volume of gas need not be corrected for variations of pressure, temperature, and tension of aqueous vapor, and if these considerations be omitted the calculation is much simplified. Thus, if 0·030 gram of nitric oxide (representing 0·075 gram of $C_2H_5NO_2$) under the *ordinary* conditions of pressure and temperature be taken to measure 23·55 cc., then

$$\frac{\text{volume of gas in cc.} \times 0{\cdot}3185}{\text{measure of sample in cc.} \times \text{density of sample}} = \text{percentage by weight of } C_2H_5NO_2.$$

If the density of the sample be omitted from the equation, the result will be the number of grams of ethyl nitrite per 100 cc. of the sample.

The nitrometer method has been proved to give very good results with pure sodium nitrite (prepared from silver nitrite) employed in known amount. The results with spirit of nitrous ether are somewhat higher than those given by Eykman's method, the difference being least when sodium chloride is employed in the latter process and time given for the ferrous solution to react thoroughly on the solution of ethyl nitrite. The results by the iodide method are almost certainly more accurate than those by Eykman's process. With most specimens of sweet spirit of nitre, a considerable amount of nitric oxide is produced (and iodine liberated) before adding the acid, the reaction probably depending on the presence of free acid in the sample. The results obtained in the nitrometer are remarkably constant, and the method furnishes a very easy means of assaying sweet spirit of nitre with considerable accuracy, which is further increased if a correction of 1·5 cc. (= 0.0048 gram of $C_2H_5NO_2$) be made for solubility of the gas. The process has the advantage of great ease and rapidity, and actually measures the nitrous compounds present in the sample, instead of leaving their proportions to be inferred from a more or less complex reaction, such as the reduction of permanganate, etc. The following results were obtained by me from six typical samples. No correction was made for pressure or solubility, the figures representing the actual volumes of gas measured at about 15° C.

	Volume of NO from 5cc.	Weight of NO from 5 cc.	$C_2H_5NO_2$ per cent.
	cc.	Milligrams.	
1. 25 per cent. sol. in absolute alcohol (two months old)	(290·0 from 0·5 cc.)	923·6	22·02
2. Spt. Nitrous Ether B. P. (two months old)	39·4	50·4	2·98
3. Spt. Nitrous Ether B. P. (age unknown)	27·0	34·6	2·63
4. Spt. Nitrous Ether B. P. (age unknown)	34·8	44·3	2·62
5. "Spt. Æther. Nit. 850" (new)	14·7	18·8	1·10
6. Sp. Æther. Nit. Dulc. ·900" (new)	22·0	28·2	1·56

No. 1 sample was prepared by Mr. J. Williams by dissolving one part by weight of carefully purified ethyl nitrite in three parts by weight of absolute alcohol. The density was ·8387. With corrections for solubility, pressure and temperature, the ethyl nitrite shown by the process in this specimen came to nearly 24 per cent. As the sample at the time of examination had a sensibly acid reaction, indicating slight decomposition, I believe the corrected result to express with considerable accuracy the actual composition of the sample. Another solution of ethyl nitrite in absolute alcohol which I have had for upwards of seven years, still contains a notable quantity of nitrous ether.

No. 2 sample was the ordinary commercial B. P. article, prepared by Messrs. Rimmington and Son, of Bradford. It gave 1 per cent. of ethereal layer by the chloride of calcium test.

Nos. 5 and 6 were analyzed immediately on opening the bottles, as freshly sent out by the wholesale house, which is one of the first reputation. I have analyzed them again, after an interval of a month, and find that 5 cc. yielded respectively 14·4 and 22·3 cc. of nitric oxide, measured at the ordinary temperature of the laboratory. Hence they were practically unchanged, though kept in a warm room.

I have also employed the process for the assay of a considerable number of other commercial samples, and it has given me every satisfaction.

The nitrometers commonly sold are furnished with three-way-taps, but for the purpose in question this is unnecessary, an ordinary tap being sufficient. A nitrometer-tube, which I have had made for me, holds 50 cc. The cup is narrow and cylindrical, and has marks at 5 and 10 cc. above the tap. This arrangement renders the use of a pipette or other separate measuring arrangement unnecessary, as the cup can be filled to the 5 cc. mark with the sample, and thus a definite amount taken for the analysis.[1]

With the aid of such a nitrometer, the assay of spirit of nitrous ether for ethyl nitrite and other nitrous compounds is reduced to an operation of the utmost simplicity, and literally does not require more than ten minutes for its completion, including the necessary calculation. The results are as constant as can be desired, and the process as near an approach to accuracy as is required for ordinary purposes. I believe

[1] Messrs. Cubley and Preston, of High Street, Sheffield, are now prepared to supply these nitrometers to those desirous of employing the process mentioned in the text.

it will afford the pharmacist or medical man a valuable means of assaying his sweet spirit of nitre, requiring as it does no out of the way reagents, or even a standard solution.[1]

In the course of the experiments made in testing the foregoing process, in many instances I observed the amount of nitric oxide set free simply by agitation with iodide of potassium, without any acid being added. It might be supposed that the gas given off at this stage of the process was that derived from the free nitrous acid of the sample; but I do not think this is strictly the case, as in experiments in which acetic acid was substituted for dilute sulphuric acid, nearly, if not quite, the whole procurable gas was evolved. Hence a sample which by decomposition contained free acetic acid would evolve nitric oxide, though no nitrous compound other than ethyl nitrite were present.

With regard to Dott's titration process, if the treatment with potassium iodide be effected in an open basin in presence of air, the amount of nitrite found is liable to be seriously in error; but if air be excluded Dott's method gives fair approximate results, somewhat in excess of the truth. The process can be advantageously employed on the solution which has already been decomposed with potassium iodide in the nitrometer. The nitric oxide is allowed to escape into the air, and the brown liquid is washed into a basin, and at once titrated with decinormal thiosulphate. 1 cc. of this solution (containing 24·8 grams of crystallized $Na_2S_2O_3$ per litre) will react with the iodine liberated by ·0075 gram of ethyl nitrite.

The results obtained in this manner show a constant difference of about 0·005 gram of nitric oxide above that corresponding to the volume of gas liberated in the nitrometer, the true amount doubtless lying between the two. The difference is most probably due to a small amount of nitric oxide remaining dissolved in the aqueous liquid, which causes the volume of gas to be slightly low, and becoming oxydized to nitrous acid during the subsequent titration liberates a small additional amount of iodine. This source of error becomes very

[1] The use of brine, in the nitrometer, instead of mercury, renders the manipulation more simple, without appreciably affecting the accuracy of the results. The nitrometer itself may be extemporized from an inverted Mohr's burette, to the nose of which a short, wide, glass tube has been fitted by means of a perforated cork. The open end of the burette is also fitted with a cork, through which passes a short length of glass tubing which is connected by narrow india rubber tubing with a wide glass tube or funnel to serve as a reservoir.

serious if the bulk of the nitric oxide be not previously removed, as is done in the nitrometer. Thus, if an attempt be made to determine ethyl nitrite by adding the sample of spirit to an acidulated solution of potassium iodide contained in an open basin, and immediately titrating with standard thiosulphate, the first result is too low, owing to the nitrous ether requiring a sensible time for its decomposition. In a few minutes this error is more than compensated by the additional amount of iodine set free by the nitrous acid produced by the action of the air on the nitric oxide formed in the primary reaction, and this liberation of iodine goes on so rapidly that the stirring necessary to mix the standard solution with the liquid in the basin causes the solution again to acquire a yellow tinge, which rapidly deepens. If the liquid in the basin be allowed to stand for some time exposed to the air before titrating, as is recommended by Dott, the iodine set free often amounts to fully twice the quantity primarily liberated by reaction with the ethyl nitrite present.

I have to thank Messrs. Dott, Dymond, Leech, MacEwan, Rimmington, Williams and others for information and samples connected with my experiments, and Mr. J. H. Worrall for assistance in the manipulations.—*Phar. Jour. and Trans., Feb.* 21, 1885, p. 673.

EXAMINATION OF SOME OLD SPECIMENS OF SWEET SPIRIT OF NITRE.[1]

By Peter MacEwan.

At an Evening Meeting of the North British Branch of the Pharmaceutical Society, held January 14, 1858, Mr. Jacob Bell, then President of the Society, in the chair, a paper on "Methylated Spirit" was communicated by Mr. J. F. MacFarlan.[2] This paper embodied "a report on the manufacture of sweet spirit of nitre from methylated spirit by Mr. Phillips." Mr. Phillips was instructed by the Government to draw up this report, because a paper which Mr. MacFarlan had communicated to the Pharmaceutical Society seemed to indicate that if methylated spirit were converted into sweet spirit of nitre, methyl alcohol was got rid of. Mr. MacFarlan did not really mean this, but such was the construction placed upon what he said.

[1] Read at a meeting of the Edinburgh Chemists' Assistants and Apprentices' Association, January 25.

[2] "Pharm. Journ.," xvii, 412.

When Mr. Phillips reported, Mr. MacFarlan heard of the report and wrote for a copy of it, which was granted. But he found that he would better understand the report if he had the specimens which Mr. Phillips had submitted; he ventured to ask them on loan and a munificent Government made him a present of them. Mr. MacFarlan submitted the specimens to the meeting and now, after the lapse of twenty-seven years, I have the good fortune to reproduce them. You will agree with me that this case[1] of specimens is of peculiar interest, for it forms a link with the past of the North British Branch and recalls Jacob Bell's memorable visits to Scotland.

Some time ago I ventured to examine a few of the specimens in order to ascertain the changes which had occurred since they were made, and I now give the results obtained. I may first, however, give you Mr. Phillips' account of the specimens.

"*Sample B.*—Sweet spirit of nitre prepared by the direct action of hyponitrous acid upon pure spirit of wine" [and distilled]. "Sp. gr. 879·05."

"*Sample C.*—Sweet spirit of nitre made from pure spirit of wine by the process of the London Pharmacopœia. Sp. gr. 858·35." (This is the portion of the distillate collected *after the nitric acid began to act.* So that it originally was much stronger than *spiritus ætheris nitrici*, P. L.)

"*Sample D.*—Obtained by passing hyponitrous acid through wood spirit [and distilling]. Sp. gr. 872·10."

"*Sample H.*—Sweet spirit of nitre prepared from methylated spirit by the process of the London Pharmacopœia. Sp. gr. 852·49."

"*Sample L.*—The same, but consists of the portion of the distillate collected after nitric acid began to act. Sp. gr. 874·85."

"*Sample N.*—The distillate obtained previous to sample L was mixed with its bulk of water and distilled. This is the second portion of distillate and is little else than a weak spirit. Sp. gr. 867·75."

[1] The case is made of solid mahogany, is 15 inches long, 8 inches high and 7 inches broad, and is divided diagonally from the top to the bottom, the upper portion forming a lid, and when secured by the hook catches, the whole case is easily portable. The lower portion is divided into twenty-one compartments for the two-ounce stoppered squats which contain the specimens. The case is not unlike a portable test reagent case.

I first determined the specific gravities at 60°F.

Sample B	0·8956	Increase	0·01655
Sample C	0·8684	Increase	0·01005
Sample D	0·8828	Increase	0·01070
Sample H	0·8616	Increase	0·00911
Sample L	0·8844	Increase	0·00955
Sample N	0 8700	Increase	0·00225

These results are corroborative of a previous statement that increase in specific gravity is one of the results of deterioration.

The next point of interest is the odor and color of the samples. B and C are free from color and their odor is similar to that of sweet spirit of nitre. D is of a yellow color and strong amylic odor. H is slightly straw-colored and has a faint acetic ether odor. L is free from color, the odor is that of aldehyde. N is free from color and has a faint naphtha odor. The whole of these specimens failed to react with ferrous sulphate and sulphuric acid, potassium iodide and acetic acid, and did not affect the color of a weak solution of rosaniline hydrochlorate. The nitrous radicle was, therefore, entirely absent.

On the other hand, the samples B to L reacted, more or less strongly with the usual aldehyde reagents. They gave the phenol-sulphonic acid reaction, the aldehyde resin coloration with potash and reduced ammonio-silver nitrate. Unfortunately, the limited quantity of the samples, and their value as a curiosity, precluded accurate quantitative estimation; but I give a fair comparison judged from the degree of color produced in 15 minutes of each, by 2 drachms of potash solution. L contained twice as much as B and C, which were nearly similar, B giving greater reduction of silver. D and H gave very little color, but reduced the silver salt more than B and C, while L gave very intense reduction; this greater reduction of silver by D, H, L is due to the presence of formic acid derived from methyl nitrite thus:

$$CH_3NO_2 + O_2 = CH_2O_2 + HNO_2$$

It is interesting to know that after the lapse of twenty-seven years the specimens still contain aldehyde, and the fact is corroborative of my statement that the aldehyde of sweet spirit of nitre does not disappear as organic acid is produced, and a determination of the acidity of B, C and L brings out clearly the fact that a large aldehyde content may exist along with a large acid content.

Standardized soda solution (1 cc. = 0·0133 NaHO) used.

L. 5 cc. required 4·3 cc. for neutralization.
B. 5 cc. required 1·8 cc. for neutralization.
C. 5 cc. required 0·8 cc. for neutralization.

We thus see, in addition to facts already recorded, that in the course of time the nitrous constituent of sweet spirit of nitre entirely disappears; that aldehyde, one of the most readily oxidizable bodies remains; and that in sweet spirit of nitre made from methylated spirit, formic acid is one of the products of decomposition.—*Phar. Jour. and Trans.*, Feb. 21, 1885, p. 675.

THE PREPARATION AND CHARACTERS OF EXTRACT OF CALABAR BEAN.[1]

By Adam Gibson.

It having come under my notice that the physical characters of extract of Calabar bean varied considerably, I have been lead to undertake the preparation of the extract by the official process and several modifications thereof, and now have the pleasure of communicating my results.

The extract is one of the four pharmacopœial extracts which are prepared with rectified spirit. These extracts are of a resinous nature and are either partially or wholly insoluble in water. Upon this point, so far as the extract under notice is concerned, there seemed to be some dubiety; thus, in Squire's "Companion" we have the statement that half a grain of extract in ten minims of water is used for subcutaneous injection, thus inferring that the extract is soluble in water, while Mr. Martindale[2] states that if carefully prepared it is not miscible with water. This question of solubility was the one which really underlay the work upon which I now report, and although there seemed to be no doubt whatever that from its nature the extract should not be soluble in water, still the fact remained that some commercial samples are soluble, and it is my endeavor now to show why they are so.

For the preparation of the extract the British Pharmacopœia directs a

[1] Read at a Meeting of the North British Branch of the Pharmaceutical Society, January 14, 1885.

[2] "Extra Pharmacopœia," 2d edition, p. 209.

pound of the beans in coarse powder to be macerated for forty-eight hours with a pint of rectified spirit, then percolated, four pints of spirit on the whole being used in the process; the percolate is evaporated in the usual manner to a soft extract. The yield of extract is exceedingly small, consequently the price is high, and possibly unremunerative. In the French Pharmacopœia (the only official statement on this point) it is stated that 1,000 grams of the beans yield 25 to 30 grams of extract of a pilular consistence; it must be borne in mind, however, that in this case the spirit used is 80 per cent., while that of the British Pharmacopœia is 84 per cent.

Having found in some preliminary experiments that the yield of extract increased as the alcoholic menstruum was diluted, I prepared several extracts with alcohol of four strengths, and obtained the following results:

Menstruum, Rectified Spirit.

Extract A.—Four ounces of the bean in coarse powder were macerated and percolated according to the official directions; the percolate measured 21 ounces.

Half an ounce of the percolate evaporated on the water-bath yielded 0·55 grain of extract, equivalent to 23·1 grains from the four ounces, or 1·32 per cent.

Menstruum, Alcohol, 66 per cent.

Extract B.—Four ounces of bean treated with this menstruum; the percolate measured 19 ounces.

Half an ounce of the percolate yielded 2·1 grains of extract, showing a total of 79·8 grains, or 4·56 per cent.

Menstruum, Alcohol, 58 per cent.

Extract C.—Four ounces of bean treated with this menstruum; the percolate measured 19 ounces.

Half an ounce of the percolate yielded 3·05 grains of extract; total yield 115·9 grains, or 6·62 per cent.

Menstruum, Proof Spirit.

Extract D.—Four ounces of bean treated with this menstruum; the percolate measured 19 ounces.

Half an ounce of the percolate yielded 4·35 grains of extract; total yield 165·3 grains, or 9·44 per cent.

We thus see that as the menstruum becomes more aqueous the greater is the yield of extract, and this is just what we would expect when we consider that water is the best solvent for the extractive matter. It would naturally be expected that the extracts so obtained, being widely different as to quantity, would present a corresponding difference of appearance. This is the case to some extent, but there is little distinction between extract *A* and extract *B*, I give, however, a short description of each.

Extract A.—A pale brown, homogeneous and viscid extract, with a somewhat fatty feeling when rubbed between the finger and thumb.

Extract B.—Similar, but when rubbed, a slight stickiness is felt.

Extract C.—A brown, homogeneous and stringy extract.

Extract D.—A dark brown extract, with black patches of resinous matter intermixed. The stringiness is more marked than in extract *C*.

It is scarcely possible to distinguish between *A* and *B*, but these are distinguished from *C* and *D* by the total absence of any stringy character. This characteristic may be useful as a rough indication of quality.

In their behavior towards water the extracts showed marked differences, and as the results make clear why some commercial samples are soluble, they are given here.

I. *Extract A.*—0·26 gram taken and triturated with cold distilled water (25 cc. used). The extract disintegrated in the mortar with difficulty; but after diligent use of the pestle it was thoroughly divided, forming a milky emulsion, which was then thrown on a wet filter. The solution filtered very slowly and was colorless. On evaporation the filtrate yielded 0·08 gram of extractive, equivalent to 30·76 per cent.

II. *Extract B.*—0·21 gram similarly treated, disintegrated more readily and gave a straw colored emulsion, which filtered a colored solution, and on evaporation yielded 0·12 gram, or 57·14 per cent. of extractive.

III. *Extract C.*—0·26 gram taken. This extract was readily miscible with the water and gave a colored and somewhat opaque solution. The extractive obtained was 0·21 gram, or 80·76 per cent.

IV. *Extract D.*—0·372 gram taken. This extract was also readily miscible with the water, and gave a pale brown but clear solution. The yield of extractive was 0·33 gram, or 88·7 per cent.

It is evident, therefore, that if we have an extract which is miscible with water, that extract has been improperly prepared.

Recognizing that the alkaloidal content of the extracts afforded the best indication of their value, I have determined the percentage of alkaloid in each case. For this purpose a weighed quantity of extract was treated with water acidulated with acetic acid and lead acetate added in excess to precipitate coloring and resinous matter. After filtration, the excess of lead was precipitated with sulphuretted hydrogen, and the liquid boiled and filtered, then evaporated to dryness and weighed—(call this "Extractive"). The residue was again dissolved in distilled water and rendered alkaline with ammonium carbonate. This was shaken with chloroform, the latter separated, filtered, and evaporated to dryness. The weight being that of alkaloid present, 0·5 gram of extract was used in each case, and the following results were obtained:

Extract A.	Extractive	0·21	gram = 42	per cent.
"	Alkaloid	0·025	" = 5	"
Extract B.	Extractive	0·365	" = 73	"
"	Alkaloid	0·013	" = 2·6	"
Extract C.	Extractive	0·40	" = 80	"
"	Alkaloid	0·009	" = 1·8	"
Extract D.	Extractive	0·432	" = 86·4	"
"	Alkaloid	0·006	" = 1·2	"

In alkaloidal value the official extract is therefore the highest; but when it comes to the question which is the best menstruum, it will be seen that rectified spirit is not the best. In fact, the official extract contains the most alkaloid, because it contains less extractive than the others. The following comparison shows the relative power of each menstruum:

Extract obtained from 4 *ounces of the drug.*

Rectified spirit 23·1 grains showing 5 per cent. alkaloid, content 1·155 grains.

Alcohol, 66 per cent., 79·8 grains showing 2·6 per cent. alkaloid, content 2·074 grains.

Alcohol, 58 per cent., 115·9 grains showing 1·8 per cent. alkaloid, content 2·086 grains.

Proof spirit 165·3 grains showing 1·2 per cent. alkaloid, content 1·983 grains.

If it were found that extract B. contained sufficient alkaloid for therapeutical purposes, the compilers of our Pharmacopœia might consider whether they should not allow it to take the place of the present extract; but apart from this, it is worthy of note that 66 per cent. alcohol is of all alcoholic menstrua the best suited for the full extraction of the alkaloid, while those of a lower percentage appear to be inadmissible on account of the large quantity of extractive matter dissolved by them.—*Pharm. Jour. and Trans.*, January 24, 1885, p. 593.

NOTE ON COMMERCIAL EXTRACT OF CALABAR BEAN.[1]

By Peter Mac Ewen.

Secretary in Scotland to the Pharmaceutical Society.

It is evident from Mr. Gibson's communication that a slight variation in the alcoholic strength of the menstruum used in the preparation of this extract may cause considerable difference in its character and alkaloidal strength, and some difference may also arise from variation in the quality of the drug. Indeed, we may surmise indefinitely regarding variation in the strength of this and other purely galenical preparations. We do not expect, under our present system, to find them uniform, but rather live in the hope of the replacement of them by "standard" preparations or by proximate principles when these answer therapeutical requirements and can be economically obtained.

Fortunately, in the case of Calabar bean, the antagonism between its two alkaloids, physostigmine (or eserine) and calabarine, has lead to an extensive use of the former alkaloid in preference to the alcoholic extract, which has repeatedly proved to be untrustworthy, owing to the conflicting action and sometimes preponderance of calabarine, and also owing to variations in alkaloidal content. But the extract has not fallen into disuse, and although the pharmacist is seldom called upon to dispense it, the cases in which it is used are of so serious a nature that it is most important that it should be of good quality and that different samples should at least approach to uniformity. In order to ascertain how far this is the case with the extracts at present supplied to the pharmacist, I have obtained eight samples from well-known wholesale houses and dispensing establishments, and have sub-

[1] Read at a Meeting of the North British Branch of the Pharmaceutical Society, January 14, 1885.

jected them to the method of examination adopted by Mr. Gibson, to whom I beg to express my obligations for a perusal of the paper which has just been read.

The extracts differed considerably in consistence, but their color was the same, a brown-black and not the pale brown noted by Mr. Gibson. I presume that the darker color is an unavoidable consequence of manufacture on the large scale. Extract No. 1 was quite granular, minute black granules being imbedded in a brown fatty extract. This extract was further peculiar in the naphtha odor which it possessed, the residuum evidently of methylated spirit used in its manufacture. From Nos. 2, 3 and 5, a film of oil exuded on standing. This separation of oil is not inconsistent with careful manufacture, because the bean contains oil, which is extracted by the proper menstruum. No. 5 was semi-liquid when received. Nos. 6, 7 and 8 were easily miscible with water; the others were not. On subjecting the samples to Mr Gibson's method, I obtained the following results:

Extract	No. 1.	Taken	0·525	gram,	which yielded
		Extractive	0·27	" =	51·42 per cent.
		Alkaloid	0·055	" =	10·47 "
"	No. 2.	Taken	0·53	"	which yielded
		Extractive	0·195	" =	36·79 per cent.
		Alkaloid	0·03	" =	5·66 "
"	No. 3.	Taken	0·55	"	which yielded
		Extractive	0·3	" =	54·54 per cent.
		Alkaloid	0·03	" =	5·45 "
"	No. 4.	Taken	0·38	"	which yielded
		Extractive	0·135	" =	35·52 per cent.
		Alkaloid	0·015	" =	3·94 "
"	No. 5.	Taken	0·155	"	which yielded
		Extractive	0·07	" =	45·15 per cent.
		Alkaloid	0·006	" =	3·87 "
"	No. 6.	Taken	0·45	"	which yielded
		Extractive	0·315	" =	70 per cent.
		Alkaloid	0·08	" =	6·6 "
"	No. 7.	Taken	0 5	"	which yielded
		Extractive	0·255	" =	52 per cent.
		Alkaloid	0·008	" =	1·6 "
"	No. 8.	Taken	0·54	"	which yielded
		Extractive	0·42	" =	77·7 per cent.
		Alkaloid	0·006	" =	1·1 "

The most noteworthy feature about these figures is the indication which they afford of the extensive variety at the disposal of the pharmacist.

When we approach the explanation of the differences we experience some difficulty, because we have no authorized statement of what extract of Calabar bean should and and should not be. In the present case we may drop Nos. 7 and 8 out of the count as being hopelessly bad, because they do not nearly approach in alkaloidal content the average of the others. But by what standard are we to judge those which remain? Dr. Hager, who of all authorities consulted, gives most attention to the pharmacy of the bean, states (*Pharmaceutische Praxis*, Suppl., p. 948) that a dry extract generally contains from 9 to 11 per cent. of physostigmine, and that 2,750 grams of bean contain about 11 grams of the same alkaloid. But he previously states (*Praxis* vol. ii, p. 678) that the bean affords about 14 per cent of extract. Now a simple calculation will show that these figures are quite conflicting, and we are justified in setting them aside as valueless for our purpose. In the circumstances we may take Mr. Gibson's extract A, as our standard of comparison; so doing, and with his communication before us, further comment on the want of uniformity is unnecessary but I may be allowed a few comments on some special features of three of the extracts.

The alkaloid obtained from No. 2 was contaminated with rubeserin the oxidation product of physostigmine. Probably this may have arisen from slight overheating of the extract during manufacture.

The high alkaloidal content of Nos. 1 and 6 gives these extracts peculiar prominence, and points either to great difference in the strength of the bean or the use of another variety of greater strength. It is most unlikely that an occasional extract of true Calabar bean should show double the alkaloid that it usually does, but from a remark by Mr. Holmes on the seed of *Physostigma cylindrospermum*, it is more likely that extracts prepared from the cylindrical bean would show such a quantity. Mr. Holmes states (*Pharm. Journ.*, [3], ix, 913) that "on touching the cotyledons with liquor potassæ I was surprised to find that while the true beans gave a permanent pale yellow tint, the cylindrical ones gave a deep almost orange color ultimately turning to a greenish hue with the same reagent." Though not an absolute proof, this is undoutedly a strong indication of greater alkaloidal strength possessed by the cylindrical beans, a strength which must necessarily be conveyed to the extract prepared from them. Now, although extract No. 1 has been prepared with methylated spirit, that as a menstruum possesses no greater solvent powers than rectified

spirit, so that the higher percentage of alkaloid cannot be due to this unwarranted and illegal modification of the official formula. You will observe in the case of No. 6 that the percentage of extractive is high, and if you compare this with Mr. Gibson's results you will find that *high extractive* indicates *low alkaloid*, but here we have both extractive and alkaloid high, and the natural inference is that the extract has been prepared from the cylindrical bean. If my surmise be correct, the use of this bean cannot be too strongly deprecated, because it is as dangerous to have preparations of too great potency as it is to have them worthless.

As the introduction of physostigmine and its salts into the new (British) Pharmacopœia has been proposed by its editors, I have no doubt that its official recognition will still further extend its use in preference to the alcoholic extract. But what shall be said of the latter, which is to remain? Should it be "standardized," or in what manner may we ensure uniformity? Granting that a certain percentage of physostigmine were fixed, that does not ensure the absence of an undue amount of calabarine, which has quite the opposite action of the other alkaloid.

There seems to be scope for further work in the direction of ascertaining whether calabarine and physostigmine are present in constant relative proportions or otherwise, and until knowledge on this point is gained, the extract cannot be said to be one which lends itself to standardizing.—*Pharm. Jour. and Trans.*, January 24, 1885, p. 594.

ALKALOIDS FROM THE BARK OF REMIJIA PURDIEANA.

By O. Hesse.

A preliminary notice of some of the results contained in this paper has already appeared. A description is given of the structure and properties of the bark. The alkaloids of this bark have been previously examined by Arnaud, who found about 0·2 per cent. of cinchonamine, and 0·8 to 1·0 per cent. of cinchonine. The author confirms the presence of these bases, but finds that several other alkaloids are present, and that the amount of cinchonine is only 0·1 to 0·2 per cent. The separation of the alkaloids is effected as follows: the finely divided bark is extracted with hot alcohol, the solution evaporated, and the residue, after treatment with excess of caustic soda, extracted with ether. The etherial solution is treated with excess of dilute

sulphuric acid, and shaken, when the sulphates of concusconine, chairamine, conchairamine, chairamidine and conchairamidine are precipitated, (A) whilst the sulphates of cinchonine and cinchonamine, with small quantities of the other bases, remain in solution (B). By addition of very dilute nitric acid to the solution (B) cinchonamine is precipitated as nitrate and cinchonine is left in solution. The precipitate A is digested with dilute soda, and the separated alkaloids, after washing, are dried in the air, dissolved in hot alcohol, and sulphuric acid diluted with alcohol, added in the proportion of 1 part H_2SO_4 to 8 parts of the alkaloids. Nearly the whole of the *concusconine* separates as sulphate, a further very small quantity separating on cooling. On adding concentrated hydrochloric acid to the cold alcoholic filtrate, *chairamine* separates as hydrochloride. The mother-liquor from this is heated, and small quantities of ammonium thiocyanate added as long as a crystalline precipitate is formed of *conchairamine* thiocyanate. After cooling and filtering, the liquid is again treated with ammonium thiocyanate, when a dark-colored pitch-like mass separates; the filtrate from this is treated with ammonia, and the resulting precipitate shaken up with benzene. The benzene solution is shaken with dilute acetic acid, and the solution of the acetates so obtained mixed with a saturated aqueous solution of ammonium sulphate, when a precipitate of chairamidine and conchairamidine sulphates is obtained. These are separated by dissolving them in boiling water and cooling, when the whole gelatinizes; on standing, crystals appear, the crystallization being complete after some days; on now heating to 40°, the *chairamidine* sulphate dissolves, whilst *conchairamidine* sulphate is left. The process must be repeated several times on the solution to obtain a pure product.

Cinchonamine and its salts have been to some extent described by Arnaud ("Am. Jour. Phar.," 1884, 156), whose results the author in general confirms, although differing in some details. *Cinchonamine*, $C_{19}H_{24}N_2O$, crystallizes in brilliant colorless needles, melts when anhydrous at 184 to 185° (194° Arnaud), is readily soluble in hot alcohol, ether, chloroform, carbon bisulphide, and benzene, sparingly soluble in light petroleum and water. Its alcoholic solution has a strong bitter taste, and an alkaline reaction, and is dextrorotary: $[\alpha]_D = +121{\cdot}1°$ at p. = 2 and t. = 15°. It dissolves in concentrated sulphuric acid with reddish yellow color, which slowly darkens; in nitric acid with an intense yellow. It is soluble in concentrated hydrochloric acid, but it

is decomposed when heated with it in sealed tubes at 150°. It yields two series of salts, normal and monacid. The *hydrochloride*, $C_{19}H_{24}N_2O,HCl$, crystallizes in anhydrous colorless plates, readily soluble in alcohol, very sparingly soluble in water (according to Arnaud it contains 1 mol. H_2O). The *platinochloride*, $(C_{19}H_{24}N_2O)_2,H_2PtCl_6$, is obtained as a yellow flocculent precipitate, apparently becoming crystalline after a time. The *hydrobromide*, $C_{19}H_{24}N_2O,HBr$, crystallizes in long flat needles, sparingly soluble in cold water. The *hydriodide*, $C_{19}H_{24}N_2O,HI$, forms long colorless flat needles. The *thiocyanate*, $C_{19}H_{24}N_2O,CNSH$, forms colorless plates or short prisms, and is very sparingly soluble in cold water. The *nitrate*, $C_{19}H_{24}N_2O,HNO_3$, forms short colorless prisms, melts at about 195°, is sparingly soluble in cold water, readily in boiling water and hot alcohol. The *normal sulphate*, $(C_{19}H_{24}N_2O)_2H_2SO_4$, crystallizes in colorless prisms, is readily soluble in hot or cold water, very sparingly soluble in cold alcohol. Its aqueous solution is dextrorotary: $[\alpha]_D = +36{\cdot}7°$ at p. = 2 and t. = 15; $[\alpha]_D = +39{\cdot}8°$ at p. = 6; and $[\alpha]_D = +39{\cdot}6°$ at p. = 2 and 2 mol. H_2SO_4. The *acid sulphate*, $C_{19}H_{24}N_2O,H_2SO_4$, crystallizes in anhydrous prisms and shows the rotary power $[\alpha]_D = +34{\cdot}9°$ at p. = 2·4 and t. = 15° and $[\alpha]_D = +37{\cdot}4°$ at p. = 6. The *thiosulphate*, $C_{19}H_{24}N_2O,S_2O_3H_2$, forms anhydrous prisms sparingly soluble in water. *Acetylcinchonamine*, $C_{19}H_{23}\overline{Ac}N_2O$, prepared by heating cinchonamine with acetic anhydride for some hours at 85°, is amorphous, sinters together at 65°, and melts at 80 to 90°, is readily soluble in ether, alcohol, chloroform and acetic acid. *Dinitrocinchonamine*, $C_{19}H_{22}(NO_2)_2N_2O$, is best prepared by dissolving cinchonamine in nitric acid of sp. gr. 1·06, and pouring the intensely yellow solution into an excess of very dilute ammonia. It forms yellow flocks, melts at 118°, is readily soluble in ether, chloroform, alcohol and acetic acid. A solution in hydrochloric acid gives with platinic chloride a yellow flocculent precipitate of the *platinochloride*, $[C_{19}H_{22}(NO_2)_2N_2O]_2,H_2PtCl_6 + 3H_2O$.

Cinchonamine methiodide, $C_{19}H_{24}N_2O,MeI + H_2O$, prepared by adding methyl iodide to a solution of cinchonamine in methyl alcohol, crystallizes in hard colorless prisms, readily soluble in alcohol, sparingly soluble in water. The *chloride*, $C_{19}H_{24}N_2O,MeCl$, is amorphous. The *platinochloride*, $(C_{19}H_{24}N_2OMeCl)_2PtCl_4$, is obtained as a yellow crystalline precipitate. The *hydroxide*, obtained by the action of silver oxide on an aqueous solution of the chloride, forms an amorphous

mass, readily soluble in water and alcohol, sparingly soluble in chloroform and ether. It has an intensely bitter taste, and is a powerful base, eagerly absorbing carbonic anhydride from the air.

Methylcinchonamine, $C_{19}H_{23}MeN_2O$, is prepared by boiling cinchonamine methiodide, chloride or hydroxide with caustic soda. It forms an amorphous white powder, melts at 139°, is readily soluble in alcohol, ether and chloroform, insoluble in water. The *chloride* is amorphous, the *platinochloride*, $(C_{19}H_{23}MeN_2O)_2,H_2PtCl_6 + 4H_2O$, is obtained as a reddish yellow flocculent precipitate.

Cinchonamine ethiodide, $C_{19}H_{24}N_2O,EtI$, forms a colorless varnish, readily soluble in alcohol, nearly insoluble in water. The *chloride* forms colorless prisms, readily soluble in alcohol and hot water. The *platinochloride*, $(C_{19}H_{24}N_2O,EtCl)_2,PtCl_4 + 2H_2O$, forms orange-colored crystals. The *sulphate*, $(C_{19}H_{24}N_2OEt)_2SO_4$, is colorless and amorphous. The *hydroxide* resembles the corresponding methyl compound.

Ethylcinchonamine, $(C_{19}H_{23}EtN_2O)_3 + H_2O$, forms a white powder, melts at 75 to 78°, or when anhydrous at 140°, and is readily soluble in ether and alcohol. The *platinochloride*, $(C_{19}H_{23}EtN_2O)_2,H_2PtCl_6 + 3H_2O$, forms a reddish yellow flocculent precipitate.

Concusconine, $C_{23}H_{26}N_2O_4 + H_2O$.—This alkaloid is obtained as the normal sulphate as already described, and is obtained in the free state by decomposition of the sulphate with dilute soda, and recrystallization from alcohol to which a little ammonia has been added. It forms colorless or pale yellow compact prisms. It is readily soluble in ether, chloroform, and benzene, sparingly soluble in boiling alcohol, insoluble in water. It is optically dextrorotary, giving for $C_{23}H_{26}N_2O_4 + H_2O$, p. = 2, t. = 15°; in 97 vol per. cent. alcohol $[\alpha]_D = 40{\cdot}8°$. The hydrate melts at 144°, becomes anhydrous, and then melts again at 206 to 208°; at 140 to 150° it becomes dark brown colored, being in small part converted into amorphous concusconine. (This amorphous concusconine is readily separated by conversion of the fused mass into the normal sulphates, treatment with alcohol in which the sulphate of the amorphous base is readily soluble, and precipitation with ammonia, when it separates in dark brown, amorphous, readily fusible flocks.) Concusconine dissolves readily in acetic anhydride apparently without formation of an acetyl-derivative; from this it seems that no hydroxyl-groups are present. Nitric acid converts it into a dark green mass; addition of nitric acid to its solution in acetic or hydrochloric acids gives the dark green coloration characteristic of this group of alkaloids.

Concentrated sulphuric acid dissolves concusconine with bluish green color, becoming olive-green on heating. With chromic acid and sulphuric acid, it gives a coloration at first dark reddish brown, then intensely dark green. Although concusconine is tasteless, its solutions in acids have a bitter taste. The salts are as a rule gelatinous. The *platinochloride* $(C_{23}H_{26}N_2O_4)_2,H_2PtCl_6 + 5H_2O$, is obtained as a voluminous yellow flocculent precipitate. The normal *sulphate*, $(C_{23}H_{26}N_2O_4)_2,H_2SO_4$, forms small white prisms nearly insoluble in water and alcohol in the cold, sparingly soluble on heating. The *acid sulphate* is a gelatinous mass readily soluble in hot water. By mixing an alcoholic solution with methyl iodide, and allowing it to stand 24 hours, there is obtained a mixture of two *iodides* in about equal quantities; they can be separated by the difference of their solubilities in hot alcohol. The less soluble *α*-compound forms microscopic hexagonal prisms of the formula $C_{23}H_{26}N_2O_4,MeI$, very sparingly soluble in hot alcohol, moderately soluble in boiling water. By treatment with silver chloride it is converted into the *chloride*, $C_{23}H_{26}N_2O_4,MeCl$, crystallizing in microscopic needles, readily soluble in water and alcohol. The *platinochloride* $(C_{23}H_{26}MeN_2O_4Cl)_2PtCl_4 + 4H_2O$, forms a yellowish red flocculent precipitate, and is insoluble in water. The *aurochloride* forms a dirty yellow flocculent precipitate, from which gold soon separates. The *sulphate* $(C_{23}H_{26}MeN_2O_4)_2SO_4$, formed by the action of silver sulphate on the iodide, is amorphous and very readily soluble in water and alcohol. Its rotary power in aqueous solution at p. = 3·764 and t. = 15° is $[\alpha]_D = +73°$. The *hydroxide*, $C_{23}H_{26}N_2O_4Me.OH + 5H_2O$, obtained by the action of baryta-water on the sulphate, crystallizes in colorless cubes, melts at 202°, is readily soluble in alcohol and boiling water, insoluble in ether. The *iodide* of the *β-compound*, $C_{23}H_{26}N_2O_4MeI$, is gelatinous and dries in air to a horny mass; is somewhat soluble in boiling water, readily soluble in alcohol. The *chloride* is amorphous. The *platinochloride* $(C_{23}H_{26}N_2O_4MeCl)_2,PtCl_4 + 5H_2O$, is a reddish yellow flocculent precipitate. The *sulphate*, $(C_{23}H_{26}N_2O_4Me)_2SO_4$, is a brown amorphous mass, and has no action on polarized light. The *hydroxide*, $C_{23}H_{26}N_2O_4Me.OH + 2\frac{1}{2}H_2O$, forms a brown amorphous mass, readily soluble in cold water and alcohol.

Chairamine, $C_{22}H_{26}N_2O_4 + H_2O$, crystallizes in white needles or thick colorless prisms, and melts at 140°, or when anhydrous, at 233. It is readily soluble in ether and chloroform, 1 part of the base dissolves in 540 parts of 97 per cent. alcohol. The alcoholic solution is

strongly dextrorotary ($[\alpha]_D$ = about 100°). Dissolved in sulphuric acid containing molybdic acid, the solution at first colorless becomes after a time an intense dark green. The *hydrochloride*, $C_{22}H_{26}N_2O_4$, $HCl + H_2O$, crystallizes in colorless needles, sparingly soluble in boiling water and alcohol, insoluble in dilute hydrochloric acid. The *platinochloride* $(C_{22}H_{26}N_2O_4)_2,H_2PtCl_6 + 2H_2O$, forms yellow needles insoluble in water and alcohol. The *normal sulphate* $(C_{22}H_{26}N_2O_4)_2$, $H_2SO_4 + 8H_2O$, forms concentric groups of colorless needles, sparingly soluble in cold water or alcohol. The *thiocyanate* forms white needles insoluble in water.

Conchairamine crystallizes with both water and alcohol of crystallization in thick colorless prisms of the formula $C_{22}H_{26}N_2O_4 + H_2O + C_2H_6O$, the compound showing three melting points, namely, 82 to 86° for the whole compound, 108 to 110° after expulsion of the alcohol, and about 120° for the anhydrous compound, the mass resolidifying between each temperature. A small portion is converted by the heating into amorphous conchairamine. Conchairamine is readily soluble in hot alcohol, in ether, and chloroform, sparingly soluble in cold alcohol. Its solution in 97 per cent. alcohol has a rotary power $[\alpha]_D = +68{\cdot}4°$ at p. = 2 and t. = 15°. The alcoholate dissolves in sulphuric acid containing molybdic acid, giving a brown coloration that soon becomes intensely dark green. With potassium chromate and sulphuric acid, it gives a coloration at first reddish brown, then dark green, and reddish yellow if boiled with excess. The *hydrochloride*, $C_{22}H_{26}N_2O_4,HCl + 2H_2O$, crystallizes in colorless plates, readily soluble in hot water and alcohol, sparingly soluble in cold water, nearly insoluble in ether. The *platinochloride*, $(C_{22}H_{26}N_2O_4)_2,H_2PtCl_6 + 5H_2O$, forms a dark yellow flocculent precipitate. The *hydriodide*, $C_{22}H_{26}N_2O_4,HI + H_2O$, crystallizes in colorless needles, sparingly soluble in cold water. The *thiocyanate* crystallizes in colorless needles, very sparingly soluble in hot water. The *sulphate* $(C_{22}H_{26}N_2O_4)_2$-$H_2SO_4 + 9H_2O$, crystallizes in long lustrous prisms, soluble in boiling water. The *nitrate* forms satiny plates or needles very sparingly soluble in water.

Conchairamine methiodide, $C_{22}H_{26}N_2O_4,MeI$, is obtained either in red crystals containing 1 mol. H_2O, or in colorless crystals with $3H_2O$. The *chloride*, $C_{22}H_{26}N_2O_4,MeCl + 2H_2O$, crystallizes in large colorless rhombohedrons, readily soluble in water and alcohol. The *pla-*

tinochloride has the complex formula $(C_{22}H_{26}N_2O_4MeCl)_2,PtCl_4 + (C_{22}H_{26}N_2O_4MeHCl_2),PtCl_4 + 14H_2O$; it crystallizes in orange-colored needles, and is insoluble in cold water. The *nitrate* forms colorless satiny plates. The *hydroxide* formed by the action of moist silver oxide on the chloride, forms an amorphous brown mass of bitter taste, readily soluble in water, insoluble in ether.

Chairamidine, $C_{22}H_{26}N_2O_4 + H_2O$, forms an amorphous white powder, melts at 126 to 128°, and is readily soluble in ether, alcohol, benzene, and chloroform, insoluble in water. Its alcoholic solution shows the rotary power $[\alpha]_D = + 7{\cdot}8°$ at p. = 3 and t. = 15°. It dissolves in concentrated sulphuric acid with yellowish color, which later turns dark green. The *platinochloride* $(C_{22}H_{26}N_2O_4)_2,H_2PtCl_6 + 5H_2O$, forms yellow amorphous flocks insoluble in water. The *normal sulphate* and *hydrochloride* are gelatinous, the *acetate* forms a slimy mass.

Conchairamidine, $C_{22}H_{26}N_2O_4 + H_2O$, crystallizes in white needles, melts at 114 to 115°, and is very readily soluble in ether, chloroform, alcohol, benzene, and acetone. Its solution in alcohol (97 per cent.) is levorotary, $[\alpha]_D = -60°$ at p. = 3 (anhydrous) and t. = 15°. It dissolves in concentrated sulphuric acid with an intense dark green color. With chromic and sulphuric acid it gives a solution at first brown, then dark green. The *hydrochloride*, $C_{24}H_{26}N_2O_4,HCl + 3H_2O$, crystallizes in long colorless needles. The *platinochloride*, $(C_{22}H_{26}N_2O_4)_2$, $H_2PtCl_6 + 5H_2O$, forms a yellow flocculent precipitate. The *normal sulphate*, $(C_{22}H_{26}N_2O_4),H_2SO_4 + 14H_2O$, crystallizes in long colorless needles, sparingly soluble in cold water. The *thiocyanate* is amorphous, readily soluble in alcohol, and sparingly soluble in cold water. The substance described under the name of concusconidine in the author's earlier communication has been found to be a mixture of alkaloids.—*Jour. Chem. Soc.*, Jan., 1885, p. 64; from *Annalen* [225], 211–262.

Rhamnus Purshiana, De Candolle.—Limousin believes this bark, cascara sagrada, to contain chrysophanic acid, and derivatives of this compound, which cause the red color, on the addition of potassa to the resinous principles obtained by Professor Prescott (see "Amer. Jour. Phar.," 1879, p. 166), and induce the change of the yellowish color of the powdered bark when kept in an atmosphere containing ammoniacal vapors.—*Jour. Phar. Chim.*, Jan., 1885, p. 80.

VARIETIES.

AMYL NITRITE AS AN ANIDOTE TO STRYCHNINE is recommended by Dr. H. O. Hare. It cannot be used by inhalation, but must be given in such quantities and at such times that its full physiological action be present constantly; it is useful only for tiding over the patient until more persistent antidotes can be administered.—*Bost. Med. and Surg. Jour.*, Nov. 20, 1884.

PICROTOXIN was used by Dr. Cauldwell for the relief of phthisical night sweats, and was found to be by far the best remedy. The dose recommended by Ringer and Murell, $\frac{1}{130}$ grain, being too small, he gave $\frac{1}{10}$ to $\frac{1}{20}$ grain in one dose at bedtime, to be repeated at midnight, if necessary. Success was invariable, and there were no disagreeable results.—*St. Louis Med. and Surg. Jour.*, Nov., 1884; *N. Y. Med. Jour.*

RHIGOLENE, a very volatile hydrocarbon of petroleum boiling at about 70° F., is noticed in several medical journals as a new local anæsthetic. It was introduced and recommended for this purpose by Dr. Henry J. Bigelow in a paper read before the Boston Society for Medical Improvement, April 9, 1866, and somewhat earlier, "kerosolene" was similarly employed by Prof. Simpson of Edinburgh. See *Amer. Jour. Phar.* 1866, p. 363.

USE OF OIL OF PEPPERMINT AND MENTHOL.—Dr. Brame states that oil of peppermint gives immediate relief of the pain in burns if applied after immersing the parts burned in water (*Lancet*). The itching of urticaria and mosquito bites is said to be much alleviated by the application of menthol.—*Cinc. Lanc. and Clinic.*

NEW ANÆSTHETIC COMPOUND.—An experimental and clinical study on a new method of producing anæsthesia is the subject of a work, recently published, from the pen of M. Colombel. A combination of *atropine* (two centigrams), *morphine* (twenty centigrams), and *chloroform* (twenty grams), is the mixture recommended. Some of the surgeons at Lyons speak very favorably of its use.—*Lancet*, Oct. 25, 1884; *Quarterly Ther. Review.*

OIL OF THYME.—Camperdon (*Bull. gén. de thérapeut.*) arrives at the following deductions: 1. In therapeutical doses (three to fifteen grains), oil of thyme causes mental excitement or stimulation; hence it is a valuable diffusible stimulant in depression following anæmia, in conditions of collapses, etc. 2. It is an active diaphoretic and diuretic. 3. From its direct action upon mucous surfaces it is to be recommended in catarrhal affections of the respiratory and genito-urinary tracts. 4. It is a prompt hæmostatic. 5. Thyme possesses powerful antiseptic properties, and is well adapted for use in surgery. 6. It is recommended that the internal administration of the drug be supplemented by its employment in the form of baths, fumigations and inhalations.—*New York Medical Journal.*

MINUTES OF THE COLLEGE.

PHILADELPHIA, March 30, 1885.

The Annual Meeting of the Philadelphia College of Pharmacy was held this day at the College Hall, No. 145 North Tenth Street. Robert Shoemaker, Vice President, in the chair, and twenty-five members in attendance.

The minutes of the last stated meeting were read and adopted.

The minutes of the Board of Trustees for January, February and March were read by Mr. Wiegand and, on motion, approved.

The report of the Librarian for the year, being called for, was read by Mr. Wiegand and accepted.

PHILADELPHIA, March 30, 1885.

The Librarian respectfully reports that the volumes of the exchanges received for the Journals have been bound, and the theses for 1884 have been arranged for the binder with a few exceptions. He reports that the library has been much more used the last year than formerly, and that the new cases erected since last report have been filled, leaving more available space for new works, and the arrangement is more perfectly carried out.

The report of the Curator was then read. It was accompanied with a bound catalogue of all the specimens in the museum, arranged and marked in such a manner that any article in the cases can be found at once. The work performed evidenced much labor and perseverance, and reflects great credit on the Curator, Mr. Zeller. The thanks of the College were unanimously tendered to Mr. Zeller for the zeal and diligence displayed by him in the work.

PHILADELPHIA, March 30, 1885.

To the Officers and Members of the Philadelphia College of Pharmacy:

During the past year the Curator has prepared a catalogue of the specimens exhibited in the cabinet, which is herewith presented. The drugs have been arranged in alphabetical order and classified. The part of the plant represented by the drug determined the separation—roots, rhizomes, leaves, flowers, fruits, etc., each forming a separate class. In order to make the work more convenient for reference an index has been added. The pharmaceutical and chemical specimens have also been arranged according to the class to which each one belongs. A number of new and valuable specimens have been presented during the year at the pharmaceutical meetings. These meetings have for many years been the source of adding many specimens to the collection, and it is hoped that with the completion of the catalogue and index an additional stimulus will be given to the members and friends of the College to make the cabinet one of the most important features of the equipment. Trusting that the interest in this direction will be maintained with renewed vigor, the above report is respectfully submitted.

CHAS. FRED'K ZELLER, *Curator.*

Mr. Bullock read a report of the Publishing Committee as shown by the Business Editor, accompanied by the Treasurer's report of the Committee which was, on motion, accepted and directed to be placed on the minutes. This report shows a satisfactory condition of affairs in this department of the College.

The report of the Editor, giving a synopsis of the year's work, shows a little falling off on the part of members and others who have heretofore contributed to the pages of the Journal, and it is to be hoped that the request of the Editor in his report will be favorably considered by them.

To the Philadelphia College of Pharmacy:

The Editor respectfully reports that, during the year ending with the publication of the March number, 63 original papers were published in the "Journal," which shows a decrease of five as compared with the preceding year, but an increase of six over the year ending March, 1883. Of this number, 20 papers were abstracts of 34 theses, 27 were contributed by 19 non-members, and 16 papers by 9 members of the College. With the exception of one year, the present report shows the smallest number of papers contributed by the smallest number of College members during the past ten years, and only five of the papers were read at four pharmaceutical meetings. This statement does not include the editorials, reviews, reports, gleanings and varieties prepared by the Editor for the pages of the Journal. The Editor takes this opportunity of urging again upon the members and friends of the College to note their observations and communicate them to the pharmaceutical meetings for discussion and to the Journal for publication. Respectfully submitted,

JOHN M. MAISCH, *Editor.*

Professor Remington, on behalf of the Committee on Deceased Members, made the following report:

Ambrose Smith, whose death was announced at the last meeting of the College, was born in Philadelphia, Eighth month 8th, 1815. He received his early education in the Friends' School and was subsequently apprenticed, to learn the drug business, to his cousin Daniel B. Smith, one of the former Presidents of this College. After completing his apprenticeship, he graduated at the Philadelphia College of Pharmacy in 1834, and was admitted as a partner in the firm of Smith & Hodgson. He retired from the above firm and formed a partnership with Henry W. Worthington for the manufacture of prussiate of potash. He afterwards engaged in business at the northeast corner of Seventh and Chestnut streets, where he remained twenty years. He subsequently removed his business to the northeast corner of Broad and Chestnut, where he remained a few years, retiring altogether from business upon the death of his wife. Ambrose Smith became a member of the College, Ninth month 16th, 1839, and he was elected Treasurer in 1850, a position which he held for over twenty years. Faithful to all trusts confided to him, quiet and unassuming in his manner, he endeared himself to all of his friends by his strict integrity and sterling worth.

Resignations of A. D. Griffith and John T. Walker, as members of the College, were read and, on motion, accepted.

Mr. Procter presented the library of the College with a pamphlet, in four parts, entitled "What may be Learned from a Tree," by Harland Coultas, 1858, and Prof. Maisch, on behalf of Henry Cramer, a member of the College, also presented three old German works, bound in one volume, dated 1718 to 1728, and entitled "Medical-chemical handbook; the wise and jolly Medicus, by Hiatrophilo, and the sensible Medicus, by Forbigern." The books were, on motion, accepted with the thanks of the College.

The following gentlemen were appointed delegates to the Pennsylvania State Pharmaceutical Association, which meets at Erie, Pa., in June next, with power to fill all vacancies which may occur in the delegation, viz.: Messrs. Alonzo Robbins, Wallace Procter, Gustavus Pile, William B. Thompson, David W. Ross.

A letter from Dillwyn Parrish, President of the College, declining to be a candidate for re-election, was read and accepted, and ordered to be placed on the minutes. The Secretary was directed to convey the thanks of the College to him for the very satisfactory manner in which he has always

discharged the duties of the office, and to express to him the great regret the members all feel at the step he has felt called upon to take.

This being the annual meeting, the Chairman ordered an election of officers, trustees and the standing committees, and appointed Messrs. Henry Trimble and Edward C. Jones, tellers, who, upon taking a ballot, reported the following gentlemen elected:

President.—Charles Bullock.
1st Vice President.—Robert Shoemaker.
2d Vice President.—William J. Jenks.
Treasurer.—Samuel S. Bunting.
Recording Secretary.—William B. Thompson.
Corresponding Secretary.—Alfred B. Taylor.
Board of Trustees (for three years).—William B. Webb, Wallace Procter, Gustavus Pile. Term ending March, 1888.
Trustee for the unexpired term of Wm. B. Thompson (elected Sec'y).—Daniel S. Jones.
Publication Committee.—John M. Maisch, Henry N. Rittenhouse, Thomas S. Wiegand, James T. Shinn, Charles Bullock.
Editor.—John M. Maisch.
Librarian.—Thomas S. Wiegand.
Curator.—Charles Frederick Zeller.

Mr. Bullock, in a few well-timed remarks, expressed his thanks for the honor conferred upon him by the members of the College, and the meeting, on motion, adjourned.

WILLIAM J. JENKS, *Secretary.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

PHILADELPHIA COLLEGE OF PHARMACY.—During the past session, two examinations were held for the purpose of determining the fitness of the junior students to proceed with their studies, in accordance with the plan which has been elaborately explained by Professor Remington in a paper published in our January number. In the following list we have placed together the questions in each department, the first two of the professors' questions being those of the November examination, and Nos. 3 and 4 those of the December examination. The final *junior examination* of the course was held on Saturday, February 14th. The number of students who availed themselves of the opportunity of extending their studies in the junior class over two years, by selecting the modified or partial examination, is somewhat greater than in previous years; but a still larger number might very properly and profitably have adopted the same course in view of the limited time left for study to those whose service in stores affords only sparse and irregular opportunities for systematic study.

BOTANY AND MATERIA MEDICA.

1. What compounds are necessary for the formation of cells? Explain the beginning, formation and growth of a cell.
2. What is the difference between a closed and an open fibrovascular bundle? Which of these fibrovascular bundles are found in the stem of a monocotyledonous, and of a dicotyledonous plant?
3. Give a description of the fertilization of the ovule of a phanerogamous plant.

4. Explain briefly the principles upon which the artificial system of classification by Linné is based.

5. Lobelia. Give the botanical name and habitat of the plant. Describe it (stem, branches, leaves, calyx, corolla, stamens, ovary and fruit). Give its medical properties and dose.

6. Give the botanical characters of the natural order of Urticaceæ. What difference is observed between American and Indian Cannabis? Give the medical properties and the dose of the Extract of Cannabis.

PHARMACY.

1. If the specific gravity of alcohol is 0·820 at 15·6°C. (60°F.), how much will the water weigh at the same temperature, which will exactly fill a bottle holding 205 grains of such alcohol?

2. Define the process of trituration, and write out a description of the mortars and pestles in use for all purposes of comminution, naming the substances that these implements are usually made of; the special uses of mortar and pestle made from each substance; the best shape for each kind; the reason for selecting the shape, and the prominent defects in the manufacture of many found in commerce.

3. Define the processes of evaporation, distillation and sublimation, and state how sublimates may be obtained in hard masses, in long crystals, in small particles.

4. Name the systems in which crystals are classed. Describe three methods of obtaining crystals, and give examples of chemical substances obtained by each method.

5. Describe four methods of preparing Syrups; give the advantages and disadvantages of each method with illustrations of four officinal Syrups, indicating in each case the reason for the preference given to the adopted method.

6. How is Liquor Potassæ prepared by the first process given in the U. S. Pharmacopœia? Explain the various steps in the process, and give the reason for selecting the Salt of Potassium which is directed. What is the chemical composition of the residue.

CHEMISTRY.

1—*a*. Describe the thermometer, and state its uses.

b. In what respects do the two thermometer scales recognized by the Pharmacopœia differ from each other?

c. Give the formulas for converting the readings of one scale into those of another.

2—*a*. What is magnetism?

b. Give the distinction between a native magnet, an artificial magnet and an electro-magnet.

3—*a*. Write two reactions, using the symbols, for the preparation of Chlorine Gas.

b. Describe the experiments illustrating the affinity of Chlorine for Hydrogen.

4. Define an acid, a base and a salt, and give an example of each.

5. What is a Sulphate, a Sulphite, a Thio-sulphate? Give the chemical formulas of the free Acids in each case, and of two salts of each.

6. Enumerate the natural varieties of Carbon, and the artificial prepared varieties, stating with each of the latter how it is prepared.

The examination in Operative Pharmacy embraced percolation, solution, filtration and evaporation. The specimens for recognition were as follows:

Anthemis,	Aqua Carui,	Sulphur præcipitatum,
Mentha piperita,	Syrupus Zingiberis,	Potassii bromidum,
Sambucus,	Extract. Ergotæ fluidum,	Ferri sulphas,
		Alcohol.

The re-examination of those students who failed in the February examination in one or more branches, will be held on Tuesday afternoon, September 29th, at 3 o'clock.

The examination of the Senior students was commenced on Thursday, February 26, and closed on Tuesday, March 3, with the practical branches of operative pharmacy and analytical chemistry. The following questions were asked:

MATERIA MEDICA AND BOTANY.

A. Rhatany Root. Give the botanical names, natural order and habitat of the plants yielding Rhatany. Describe the drug and point out the distinguishing characters of the officinal varieties. Give the constituents, the medical properties and the dose.

B. Define *Aconite* of the Pharmacopœia; name the plant, its natural order and habitat. Describe the physical characters and the structure of the drug. Give the approximate per centage of the alkaloids, and name the constituents. What are the medicinal properties and the dose of the drug?

C. Wild Cherry. Give the officinal name of the drug, and the botanical name, natural order and habitat of the plant. Describe the drug, give its constituents, the reaction and approximate percentage of poisonous principle resulting in the presence of water, and explain the difference of the drug collected in spring and in autumn. What are the medicinal properties and dose?

D. Uva ursi. Give the name, natural order and habitat of the plant; describe the drug, name the constituents and state which of these possess a bitter taste, and to which the diuretic and the astringent properties are due. Name some leaves containing the same principles.

E. Define *Conium* of the Pharmacopœia, and give the name, natural order and habitat of the plant. Describe the physical characters and structure of the drug; give the approximate percentage of alkaloids, and characterize these briefly as to their physical and poisonous properties. What is the dose of Conium and how is it distinguished from Anise?

F. Capsicum. Give the name, natural order and habitat of the plant, describe the drug and point out the difference in size and shape of the fruits of other species; give the acrid and other constituents, the medicinal properties and dose of the drug.

G. Stramonium Seed. Give the name, natural order and habitat of the plant, describe the drug and its internal structure, give its medicinal properties, dose and the approximate percentage of alkaloids, also a distinguishing test for the two alkaloids.

H. Define *Kamala* of the Pharmacopœia, and give the name, natural order and habitat of the plant. Describe the drug, including the structure of its different portions, name its solvents, constituents and the amount of ash yielded, and give its medicinal properties and dose.

I. Name the officinal *Gumresins of the Umbelliferæ;* give for each the botanical name, and habitat of the plant, and briefly describe the drug. Give the approximate proportion of the chief constituents and state which of the volatile constituents contain sulphur, and which are free from it.

K. Spanish Flies. Give the name, order, habitat and mode of collection of the insect, and the approximate percentage of the vesicating principle, with a process for preparing it. In what respects do Chinese blistering flies differ from the officinal drug?

THEORY AND PRACTICE OF PHARMACY.

A. Name the officinal liquid, of which 25 grammes measures 20 cc. at 4°C. How many grains of mercury will a bottle hold which contains

exactly a pint of water at 60°F? Name, and give the specific gravity of the heaviest liquid for which the Pharmacopœia details a process for manufacture. Write out the process for this preparation.

B. Give the unabbreviated officinal names, ingredients, outlines of process, and describe the appearance of Black Draught, Simple Elixir, Lugol's Solution, Cold Cream, Spermaceti Cerate, Hoffman's Anodyne, Compound Spirit of Juniper, Compound Syrup of Sarsaparilla.

C. Give the English names, ingredients, outlines of process, and describe the appearance of Infusum Digitalis, Liquor Ferri Subsulphatis, Emplastrum Ammoniaci cum Hydrargyro, Syrupus Scillæ Compositus, Tinctura Cinchonæ Composita, Unguentum Gallæ, Spiritus Ætheris Nitrosi, Pulvis Antimonialis.

D. Give the officinal names, quantities and ingredients for one pound avoirdupois of Aromatic Powder, Cerate, and Tincture of Opium.

E. What is Pectose? Name several substances which contain it. What is the effect of the action of heat and acids upon it? What expedient is resorted to, in officinal processes, to overcome the effects produced by its presence in drugs?

F. Give the process, specific gravity, tests of purity and identity of the following: Stronger Ether, Alcohol, Carbolic Acid.

G. Give the tests for recognizing Veratrine, Polygalic Acid, Colchicine, Strychnine, Meconic Acid.

H. Of the following six liquids which are the best solvents for Tannin, namely: water, absolute alcohol, chloroform, glycerin, absolute ether, boiling water. Place the solvents in the order of their solvent power, beginning with the best.

I. How is Diluted Hydrocyanic Acid prepared? What is the standard of strength adopted by the U. S. Pharmacopœia? In what important respect does the present formula differ from that of the U. S. Pharmacopœia, 1870? In what officinal Syrup is this Acid found? Why is it present in this Syrup? Name the active substance produced when ground Black Mustard Seed is treated with water, and state how it is produced. Describe the process for an officinal preparation whose virtues depend upon the presence of this active substance.

K. Describe the theory of emulsification. Name a natural emulsion and describe its structure. Give three practical formulas illustrating three different methods of preparing emulsions. State the circumstances under which it would be best to use each method.

CHEMISTRY.

A. Define a neutral salt—an acid salt—a basic salt—a double salt. Give examples of each of these classes.

B. What is the chemical formula of *Alumen?* In what respect does the *Alumen* of the U. S. Pharmacopœia, 1880, differ from the *Alumen*, U. S. Pharmacopœia, 1870? How is *Alumen Exsiccatum* made? What are the properties of the metal contained in each of these compounds?

C. Give the chemical formula of *Argenti Nitras* and describe the officinal preparation. What is the composition of *Argenti Nitras Dilutus*—of *Argenti Nitras Fusus?*

D. What is "*Chili Saltpetre?*" What differences in properties do we find between this compound and common Saltpetre? Which is the more advantageous for use in the manufacture of Nitric Acid? Give reasons for this preference. State the important technical uses of each of these two compounds.

E. What is the composition of "Salt of Tartar?" By what process is it made and from what material? From what source do we obtain "Cream of Tartar?" Give its chemical formula and that of "Tartar Emetic."

F. Give the distinction between *ferrous* and *ferric* salts. Give examples of each class, using officinal compounds only. How can ferrous be con-

verted into ferric compounds? What officinal processes make use of such methods?

G. Give the formulas of *Acidum Oxalicum*, *Acidum Oleicum*, *Acidum Valerianicum*, *Acidum Tartaricum*, *Acidum Citricum*. Give the formula of a salt of each of these acids.

H. What is fermentation? Mention the several kinds of fermentation and state the products of each. Explain how starch-containing cereals are capable of fermenting. Mention some industries based upon fermentation processes.

I. What is the chemical difference between an essential oil and a fatty oil? What differences are there in their physical properties? From what natural sources are the two classes respectively obtained? What are the pharmaceutical and technical uses to which each class is applicable?

K. What is a Glucoside? By what reactions are they to be distinguished? Mention some officinal drugs of which the active principle is a Glucoside. Mention some Glucosides which yield officinal compounds as their decomposition products.

EXAMINING COMMITTEE.

A. Give the process for making *Yellow Oxide of Mercury*. State what precautions are necessary, and the reasons why. Give its officinal title. What officinal preparation does it enter into? How does it differ from the *Red Oxide of Mercury*? Give the process for the manufacture of *White Precipitate*. What precautions must be observed in making it? What is its chemical composition? Into what officinal preparation does it enter? Describe the process for the manufacture of *Citrine Ointment*, and explain the chemical changes which take place.

B. Give the *Officinal Name*. *Natural Order* and *Habitat* of five dicotyledonous plants which yield officinal rhizomes. Name the important constituents, and medicinal properties of each.

C. Give the formula of the compound which is formed when Ammonium Sulphide is added to a Salt of Aluminium. How is Aluminium separated from iron? How is iron separated from zinc? Give the color and formula of each of the precipitates produced by Sulphuretted Hydrogen on Salts of the following metals in acid solution: Mercury, Arsenic, Antimony. State how Calcium Salts may be detected in Sulphate of Magnesium.

D. Give the botanical name and natural order of the plant from which Almonds are obtained. Briefly describe the physical properties and structure of the seed. What are the chief constituents of Almonds? In what important constituent do the two varieties differ? Explain, in words or symbols, the chemical reaction which occurs when powdered bitter Almonds are macerated with water. What two officinal *products* are obtained from Almonds? Into what officinal preparations do these *products* enter? Into what officinal preparations do *Almonds* enter.

E. Name three officinal *Fluid Extracts* each made with a different menstruum. Give the proportions of the liquids composing the menstruum in each case. State why such variations are necessary. Why is maceration for a specific period directed in making Fluid Extracts? How much finished Fluid Extract is obtained from a kilogramme of drug?

F. Give the officinal name, natural order and habitat of the plant which yields Hops. Describe the physical properties and structure of Hops, and name an officinal preparation into which they enter. What other officinal substance does the plant yield, and from what part is it obtained? Give its physical and medicinal properties, and important constituents. What officinal preparation does it enter into?

G. Name the ingredients which enter into the composition of the following preparations; state briefly the mode of preparation and give the officinal title and dose of each: Dover's Powder, Spirit of Mindererus, Donovan's Solution, Brown Mixture, Compound Cathartic Pills.

H. Name the article of commerce from which Cream of Tartar is purified. State from what source this article is derived, and in what manner it is formed. What impurity is always found in it? Describe briefly a process of purification. What takes place when a boiling solution of Cream of Tartar is allowed to cool, and why? What are the chemical constituents of Cream of Tartar? What is its officinal title?

I. How should this prescription be compounded?

℞ Ammon. Carb..... ℥iss
Syrup. Scillæ..... f℥iss
Pulv. Acaciæ..... ℥iii
Aquæ ..... f℥iiss
M. ft. mist.

Signa. Take a teaspoonful every four hours.

Criticise the following prescription:

℞ Quininæ Sulph..... gr. xxxii
Acid. Sulph. Aromat.... gtt. lxiv
Aquæ..... f℥ii
Spt. Ammon. Aromat.. f℥ii
M. ft. mist.

Signa. Take a teaspoonful every four hours.

How should this ointment be prepared?

℞ Iodi..... ℈i
Extract. Opii..... gr x
Camphoræ..... gr. xv
Extract. Bellad. Alc..... ℈i
Adipis Benzoinat..... ℥i
ft. ung.

Signa. Apply as directed.

K. How would you prepare this prescription? What quantity of each active ingredient is contained in a dose? Would you dispense it? Give your reasons why.

℞ Strychninæ Hydrochlorat. gr. i
Hydrarg.Chlorid.Corrosiv. gr. ii
Liq. Acid. Arseniosi..... f℥ii
Tinct. Ferri Chlorid..... f℥iv
Syrupi ..... f℥ii
Elixir Aurant.....ad f℥viii
ft. mist.

Signa. A tablespoonful three times a day.

How should this prescription be prepared? What reactions occur? What will the solution contain when finished? Is the dose a proper one?

℞ Argenti Cyanid..... gr. xxx
Acid. Hydrochloric.... gr. xxv
Aquæ Destillatæ..... gr. ccIxxv
Misce.

Signa. Take sixty drops three times a day in a tablespoonful of water.

Write out the full name of each ingredient, and the direction for use.

℞ Hyd. Chlor.
Mur. Hyd[1].....aa ℈i
Acaciæ Pulv..... ℥iv
Aq. Camph..... f℥viii
Misce.

Signa. Injection. Use t. d.

The specimens selected for recognition were as follows:

Materia Medica.	Pharmacy.	Chemistry.	Committee.
Taraxacum,	Pulv. Cretae comp.,	Potassii bicarbonas,	Quassia,
Spigelia,	Pulv. Rhei comp.,	Potassii chloras,	Pimenta,
Quassia,	Infusum Digitalis,	Potassii permanganas,	Nux vomica,
Frangula,	Liquor Pepsini,	Sodii bicarbonas,	Terebinthina,
Rhus Toxicod,	Vinum aromaticum,	Ammonii chloridum,	Ceratum resinae,
Senna (Alex.)	Tinct. Saponis viridis,	Magnesii carbonas,	Tinctura Myrrhae,
Scoparius,	Tinct. Aloeset Myrrhae,	Zinci acetas,	Aqua Camphorae,
Anisum,	Syrupus Rosae,	Plumbi acetas,	Potassii ferrocyanid
Physostigma,	Extract. Ergotae fluidum,	Acidum aceticum,	Alumen,
Lycopodium.	Unguent. Hydrargyri.	Benzinum.	Plumbi oxidum.

In Operative Pharmacy the candidates were required to prepare—

1. Granulated sodium salicylate.
2. Lozenges, each containing 5 grains of potassium chloride.
3. Emulsion of codliver oil, containing 50 per cent of the oil.
4. Unguentum hydrargyri nitratis.
5. Soap plaster, 4 x 6 inches.

In Analytical Chemistry the acids and bases had to be determined qualitatively in solutions containing three or four salts.

[1] The two articles are hydrate of chloral and muriate of hydrastine; the abbreviations were copied from prescriptions.—Editor.

The competitive examination of drugs with the microscope for the John M. Maisch prize by those candidates who had passed a "very satisfactory" examination in Materia Medica, including specimens, was conducted by John E. Cook, Ph.G., twelve candidates being entitled. The microscopic specimens selected were Senega, Zingiber, Calamus, Cinchona (micrantha), Anisum, Carum, Linum, Hyoscyami semen, Lycopodium and Marantæ amylum. One of the candidates recognized all 10, one 9, one 6, and the remaining 5 or 4 of the specimens.

The following 147 students successfully passed in all branches, and were recommended to the Board of Trustees for the degree of Graduate in Pharmacy (Ph. G.):

George Sidney Amsden, Iowa, *Materia Medica for Students.*
Philip Anthes, Pennsylvania, *Lard and Adulterations.*
James Henry Barker, Louisiana, *Fluid Extracts.*
Max Bartel, Wisconsin, *Caryophyllus.*
Henry Bechberger, Ohio, *Our Own vs. Patent Preparations.*
William Bichy, New York, *Stillingia.*
Wayne Barker Bissell, New York, *Hop Extract.*
Luther Pascal Bowers, Maryland, *Æther Aceticus.*
Wm. Theodore Bozenhard, Ohio, *Hypophosphorous Acid.*
Henry Brandner, Jr., Kansas, *Assay of Cinchona.*
Albert Edward Brown, Alabama. *Analysis of Sulphate of Morphia.*
Robert Clark Cadmus, Pennsylvania, *Liquor Ferri Chloridi.*
Edward Daily Cahoon, Delaware, *Early Chemistry.*
George Lewis Carnan, New Jersey, *Concentrated Nitrous Ether.*
Carleton Cole Champion, Pennsylvania, *Future of Retail Pharmacists.*
Thomas Clements Coltman, Pennsylvania, *Fraxinus Americana.*
James Sherman Cooley, New Jersey, *Pharmacy Laws.*
Charles John Craythorn, New Jersey, *Alcohol.*
Samuel Ross Crothers, Maryland, *Pharmacy.*
Fred. Horace Davis, Delaware, *Ailanthus Glandulosus.*
Blythe James Davison, Pennsylvania, *Mentha Piperita.*
Oscar Boone Deakyne, Delaware, *Citric Acid.*
David Ferguson Deem, Indiana, *Cod Liver Oil.*
William Edward DeLong, Pennsylvania, *Chemistry and Pharmacy.*
George Eicholtz Dennisson, Pennsylvania, *Sanguinaria Canadensis.*
Ulysses Grant Dennison, Delaware, *Cod Liver Oil.*
William Milliken Denniston, Pennsylvania, *Arsenious Acid.*
William D. Deuschle, Ohio, *Elixirs.*
Morton Phelps Dickeson, Pennsylvania, *Emulsions.*
Henry Diefenbeck, Pennsylvania, *Hydrangea.*
Lewis Henry Dielman, Maryland, *Erythroxylon.*
Hermann Edward Frederick Dreiss, Texas, *Pepsin.*
Thomas Dunbar, Jr., Pennsylvania, *Liriodendron Tulipifera.*
George Henry Ebeling, West Virginia, *Hydrargyri Iodidum Viride.*
Jacob Addison Eberly, Pennsylvania, *Suppositories.*
George Washington Edmonds, Pennsylvania, *Pepsin and Peptones.*
Joseph Johnson Eldredge, New Jersey, *Pills and Excipients.*
Samuel S. Ely, Pennsylvania, *Crystallization.*
John George Engler, Connecticut, *Syrupus Pruni Virginianæ.*
Theodore Fairheller, Pennsylvania, *Emulsions.*
Edward Henry Fienhold, Pennsylvania, *The Pharmacist.*
Ralph Benton Gable, Pennsylvania, *Old and New Pharmacopœia Formulas.*
Adolf Emil Gebhard, Michigan, *Mounting of Botanical Specimens.*
Peter Spang Gehris, Pennsylvania, *Erythrina Piscidia.*

Benjamin Wallace Green, Maryland, *Pharmaceutical Extracts.*
George Adam Haffa, Pennsylvania, *Green Iodide of Mercury.*
James Hervey Hagenbuch, Pennsylvania, *Chocolate.*
Jesse Barclay Hall, Pennsylvania, *Medicinal Herbs of Montgomery Co.*
William Swearingen Hamilton, West Virginia, *Gaultheria.*
Arthur Browne Hammond, Maryland, *Liquor Magnesii Citratis.*
Silas Marion Harrington, Texas, *Estimation of Alkaloids in Ignatia.*
William Franklin Harper, Indiana, *Physostigma Venenosa.*
Clinton Kelty Harris, New Jersey, *Simple Elixir.*
Norton O. Harris, Delaware, *Oleum Morrhuæ.*
Daniel Herr Hassler, Pennsylvania, *Lime Fruit Juice.*
Julius Dargan Haynsworth, South Carolina, *Oil of Turpentine and its Manufacture.*
Henry George Heider, Wisconsin, *Syrupus Rhei.*
Harry Ernest Heinitsh, Pennsylvania, *Tinctura Avenæ Sativæ.*
Edwin Hutter Hess, Pennsylvania, *Dover's Solution*
James Owen Howells, Ohio, *Ohio Wines and Derivatives.*
James Hunter, Jr., Pennsylvania, *Carbo Animalis.*
James Stanton Hunter, Pennsylvania, *Pulvis Ipecacuanhæ et Opii.*
George Edward Hurd, Wisconsin, *Oleum Anthemidis Cotulæ.*
Harry Ellsworth Jones, New Jersey, *Nitrate of Silver.*
George Alexander Keller, Pennsylvania, *Oleic Acid and Oleates.*
Stephen Rush Ketcham, Pennsylvania, *Emulsions.*
Grant Elmer Kirk, Pennsylvania, *Eriodictyon Californicum.*
Gustav Frank Kuehnel, Wisconsin, *Rhododendron Maximum.*
William Evans Kunkel, Pennsylvania, *Petroleum Ointments.*
Elmer Bryan Kyle, Pennsylvania, *Menthol.*
James Almer Kyner, Pennsylvania, *Butter.*
Frank Theodore Landis, Pennsylvania, *Japanese Menthol.*
Irvin Lincoln Lautenbacher, Pennsylvania, *Milk and Derivatives.*
William John Laval, Indiana, *Menthol.*
William M. Lewis, Pennsylvania, *Pills and their Excipients.*
Llewellyn Hughes Lewis, Pennsylvania, *Erythroxylon Coca.*
Frederick Jacob Lichtenberger, Illinois, *Thesis Writing.*
Charles Napier Lochman, Pennsylvania, *Collinsonia Canadensis.*
Henry Charles Christian Maisch, Pennsylvania, *Illicium Floridanum.*
Joseph Mark Malatesta, Pennsylvania, *Opium.*
Robert Borton Matter, Pennsylvania, *Hydrargyrum cum Creta.*
Charles Milton Mauch, Jr., Pennsylvania, *Compound Tincture of Cinchona.*
Rollin R. May, Delaware, *Amyl Nitrite.*
Charles Eugene Mayer, Pennsylvania, *A Pharmacy.*
Paul Ernest Meissner, Wisconsin, *An Indispensable.*
Robert Stockton Johnson Mitcheson, Pennsylvania, *Olea Volatilia.*
Frank Morse, Indiana, *Advantages of Pharmaceutical Manufacturing.*
Matt. U. S. Grant Moses, New Jersey, *Formation of Honey.*
Elmer Marshall Mount, Delaware, *Pepsin.*
Edward Oliver Moyer, Pennsylvania, *Oleates.*
Edgar Harman Naudain, Delaware, *Pinckneya Pubens.*
Jacob Lewis Nebinger, Pennsylvania, *Some Officinal Syrups.*
John W. Newton, Ohio, *Coloring Matter of Hydrastis Canadensis.*
Harry Louis Odenwelder, Pennsylvania, *Chloral Hydrate.*
George Widdifield Pancoast, New Jersey, *Solubility of Quinine Pills.*
Albert Raymond Patterson, Ohio, *Pharmacy.*
Leopold Peters, Illinois, *Vinum Ipecacuanhæ.*
Charles Clifton Ramey, Pennsylvania, *Gossypium Herbaceum.*
Dennis Reagan, Pennsylvania, *Mentha Piperita.*
Charles Morris Rebner, Kansas, *Scammony.*
Charles Frederick Rebsamen, Kansas, *Practical Remarks.*
Henry Otto Reinnoldt, Wisconsin, *Magnesii Sulphas.*
Walter Reynolds, Pennsylvania, *Oleum Gossypii Seminis.*
William Stevens Rhoads, Pennsylvania, *Oleum Menthæ Piperitæ.*

Elias Ellsworth Riggs, New Jersey, *Emulsions.*
Joseph Cuttell Roberts, Delaware, *Fraxinus Americana.*
Benjamin Rosenzweig, Pennsylvania, *Extr. Rhei Fluidum.*
George Frederick Rössler, Germany, *Practical Hints.*
Andrew Curtin Santee, Pennsylvania, *Rubus.*
Henry Scholey Saunders, Canada, *Cross Sections.*
Emil Schaible, Indiana, *Carbonate of Ammonia.*
Carl Edward Schlegel Iowa, *Illicium.*
Allen Curtis Schofield, Ohio. *Hamamelis*
Herman Julius Schuchard, Texas, *Gum Mezquite.*
Frederick Schwartz, Pennsylvania, *Grains of Paradise.*
Wm. Frederick Seiler, Pennsylvania, *Ammonia.*
Abraham Lincoln Serfass, Pennsylvania, *Pills and Excipients.*
Henry Clay Shaw, West Virginia, *Orange Trees.*
Frederick Paul Sher, Pennsylvania, *Simaruba.*
Hans Heinrich Sinne, Germany, *Salicylic Acid.*
Christopher Columbus Smith, Pennsylvania, *Bismuth and Preparations.*
George Mark Smith, Pennsylvania *Assay of Opium.*
Harry Barr Snavely, Pennsylvania, *Thymus Vulgaris.*
Samuel Davis Swann, Florida, *Erythroxylon Coca.*
Harry Swain, Delaware, *Pulverization of Drugs.*
George Augustus Steinicken, Delaware, *Petroleum.*
John Henry Sterner, Pennsylvania, *Hydrocyanic Acid.*
Henry Deischer Stichter, Pennsylvania, *Opiates.*
Henry Lippincott Stiles, New Jersey, *Abstracta.*
Samuel Franklin Stoll, Ohio, *Excipient for Pills.*
Hugh McCallum Thiebaud, Indiana, *Erigeron.*
William Cochran Thompson, Pennsylvania, *Ustilago.*
Frederick Alden Tifft, New Jersey, *Cellulose.*
Thomas Crowell Trefry, Nova Scotia, *Oils of Rose and Wintergreen.*
Samuel Levick Van Buskirk, Pennsylvania, *Maydis Stigmata.*
William Augustus Vannort, Maryland, *Acid Hydrocyanic Dilute.*
Frank Herman Von Achen, Illinois, *Assay of Quinine Pills.*
Samuel C. Webster, Pennsylvania, *Gossypium.*
Henry Wegener, Jr., Wisconsin. *Aspidosperma Quebracho.*
Benjamin Franklin Weisel, North Carolina, *Nitrate of Silver.*
Neri Barndt Williams, Pennsylvania, *Nabalus Albus.*
Charles Bennett Whilden, South Carolina, *Iodoform.*
J. Frederick Windolph, Delaware, *Sprups by Cold Percolation.*
Robert Wellesley Woodill, Nova Scotia, *Alcohol.*
Alfred Conard Wood, Pennsylvania, *Chloride of Gold and Sodium.*
James Edward Wright, Pennsylvania, *Cane Sugar.*
William Oscar Yost, Pennsylvania, *Verbascum Thapsus.*

The final reunion of the Graduating class preceding the Commencement took place on Monday evening, March 23, in the Museum, at the professors' supper, when most of the officers of the College and of the members of the Board of Trustees were present, also several gentlemen from other Colleges of Pharmacy. The graduating class presented to the College two well-executed portraits of Prof. Trimble and of C. F. Zeller, Ph.G, assistant to the chair of pharmacy; and one of Rogers' groups of statuary was presented to Prof. Remington.

The commencement exercises were held at the Academy of Music, on the evening of March 24, when the degree of Graduate in Pharmacy was conferred upon the above successful candidates by Charles Bullock, first vice-president of the College. Mr. W. J. Jenks presented the Procter prize, a gold medal, to Henry C. C. Maisch and W. D. Deuschle, they having

attained the grade "very satisfactory" in each of the seven branches of examination.

The following students were awarded honorable mention, the general result of their examination having attained the grade "distinguished:" H. Bechberger, H. Brandner, Jr., W. D. Deuschle, J. O. Howells, G. E. Kirk, W. J. Laval, H. C. C. Maisch, R. B. Matter, P. E. Meissner, E. H. Naudain; and the following with the grade "meritorious:" Wm. Bichy, W. B. Bissell, O. B. Deakyne, J. G. Engler, S. M. Harrington, H. E. Heinitsh, C. N. Lochman, E. O. Moyer, J. W. Newton, E. Schaible, C. E. Schlegel and H. J. Schuchard. Mr. Wm. B. Thompson presented the Henry C. Lea prize, one hundred dollars, for the best Thesis to Henry C. C. Maisch, honorable mention being accorded to D. H. Hassler, C. E. Schlegel, G. E. Hurd and J. O. Howells. The Materia Medica prize, a Zentmayer histological microscope for the histological and chemical examination of an American drug, was presented by Prof. Maisch, to G. E. Hurd, with honorable mention of H. S. Saunders and G. E. Dennisson. Prof. Sadtler presented the chemistry prize, a Troemner analytical balance, for analytical work, to H. C. C. Maisch, with honorable mention of W. Bichy, C. E. Schlegel, D. H. Hassler, J. O. Howells and A. E. Brown. The John M. Maisch prize, twenty dollars in gold, offered by Mr. J. H. Redsecker, of Lebanon, Pa., for the best microscopical examination of drugs, was presented by Prof. Maisch to J. G. Engler, with honorable mention of H. Bechberger, W. Bichy, W. B. Bissell, H. Brandner, Jr., O. B. Deakyne, W. D. Deuschle, W. J. Laval, H. C. C. Maisch, P. E. Meissner, E. O. Moyer and E. Schaible.

The valedictory address was delivered by Professor Sadtler, and the exercises terminated with the distribution to the graduates of many presents, including flowers, a commendable feature being that the latter were comparatively less numerous than in former years, while the useful presents and permanent souvenirs sent by the friends of the graduates, were evidently considered to be far more appropriate to such an occasion.

ALUMNI ASSOCIATION OF THE PHILADELPHIA COLLEGE OF PHARMACY.—The twenty-first annual meeting was held in the Alumni room of the College building, on Friday afternoon, March 20, 1885, the President, Dr. C. A. Weidemann, in the chair. The President's annual address and the Secretary's report gave a condensed account of the work done during the past year. The twentieth anniversary of the organization of the Association had been commemorated by an excursion to Woodland Beach, the success of which led to the proposition of a similar celebration at each anniversary. The faithful services of the Treasurer, Edward C. Jones, during a period of many years, received well-deserved recognition. The average attendance at the five social meetings during the past winter was 115. The class in microscopy, under the efficient instruction of A. P. Brown, Ph.G., numbered 11 students; the importance of this work is evidently not recognized by the large majority of students, but it is to be hoped that a larger number will avail themselves of this opportunity during this spring and hereafter. The Alumni quiz classes were in successful

operation during the past session. Since the last annual meeting, 112 graduates became members of the Association, and 14 members died, the total membership being 1,016.

The following officers were elected to serve for the ensuing year: President, Howard B. French, class 1871; Vice Presidents, Wallace Procter, class 1872 and D. W. Ross, class 1877; Treasurer, E. C. Jones, class 1864; Recording Secretary, Wm. E. Krewson, class 1869; Corresponding Secretary, Clement B. Lowe, class 1884; Trustee of Sinking Fund Thomas S. Wiegand, class 1844.

The annual reception was held on the evening of the same day in the Pharmacy lecture room. The annual oration was delivered by Dr. F. E. Stewart, class 1876, the valedictory on behalf of the class by C. C. Ramey, and the class history by A. G. Hammond. The class prophet being unavoidably absent, the oration having "The Future of the Class" for its theme was not given. The Alumni prizes were awarded as follows: gold medal to H. C. C. Maisch, of Philadelphia; and certificates in materia medica to W. J. Laval, of Evansville, Ind.; in pharmacy to J. F. Windolph, of Dover, Del.; in chemistry to J. O. Howells, of Bridgeport, O.; in general pharmacy to W. D. Deuschle, of Chillicothe, O; in operative pharmacy to H. Brandner, Jr., of Atchison, Kan.; in analytical chemistry to G. E. Kirk, of Philadelphia, and for the best collection of herbarium specimens of indigenous plants to F. P. Sher, of Philadelphia. The junior testimonial was awarded to W. B. Cheney, of South Manchester, Conn.

THE ZETA PHI ALPHA SOCIETY OF THE PHILADELPHIA COLLEGE OF PHARMACY held its triennial reunion, March 19th, at the museum of the College, about 140 ladies and gentlemen being present. Mr. Howard B. French presided and Mr. Thomas H. Potts officiated as toastmaster. At the meeting held in the afternoon, Mr. G. W. Kennedy was elected President for the ensuing term.

THE NEW YORK COLLEGE OF PHARMACY held its fifty-fifth annual commencement at Steinway Hall, March 17th, addresses being made by the President of the College, Ewen McIntyre, by Rev. R. C. Collyer and by B. E. Miot, Ph.G. The degree of Graduate in Pharmacy was conferred upon 71 candidates; in addition to these, three candidates had passed in pharmacy and five candidates in all branches except pharmacy.

THE LOUISVILLE COLLEGE OF PHARMACY, at its recent commencement, had 7 graduates. The following officers were elected for the ensuing year: President, E. Scheffer, Sr.; Vice Presidents, J. W. Fowler and W. Rogers; Recording Secretary, Fred. C. Miller; Corresponding Secretary, O. A. Beckmann; Treasurer, C. Tafel; Curator, O. E. Mueller.

THE ALUMNI ASSOCIATION OF THE LOUISVILLE COLLEGE OF PHARMACY elected the following officers: President, O. E. Mueller; Vice Presidents, B. Buckle, M.D. and P. Schlosser; Recording Secretary, O. C. Dilly; Cor-

responding Secretary, A. Schachner; Treasurer, P. Fischer; Executive Board, W. Tafel, E. Goebel, E. Scheffer, Jr., A. J. Schoettlin and S. Flexner. The Association contributed $25 towards purchasing instruments for the use of the College.

THE PITTSBURG COLLEGE OF PHARMACY conferred the degree of Graduate in Pharmacy upon six candidates at the commencement, March 17th.

THE ST. LOUIS COLLEGE OF PHARMACY held its nineteenth commencement at Memorial Hall, March 18th.

THE ALBANY COLLEGE OF PHARMACY held its fourth commencement at Agricultural Hall, March 2d, eight candidates graduating.

EDITORIAL DEPARTMENT.

THE QUALIFICATIONS OF A GRADUATE IN PHARMACY, as far as they relate to practical experience in the drug business and to the age of the candidate, have been discussed in an open letter addressed "to the Conference of Teaching Colleges of Pharmacy" by the Board of Pharmacy of the State of Illinois, in which the following statement is made:

This Board has received applications of late for registration from persons claiming to be Graduates in Pharmacy, and who present as credentials to support their claims what are termed "Certificates of Graduation" or "Minor Certificates," issued by Colleges of Pharmacy holding membership in your organization; inquiry developing the fact that the holder at the time of final examination was lacking in age or experience and that these certificates were to be held until the age or experience is had, when a diploma will issue.

The Board is perfectly correct in refusing to recognize such certificates; in fact, Section 3 of the Pharmacy Law of Illinois, passed in 1881, compels the Board to take this course, because such certificates are not a "satisfactory diploma," nor are they "credentials of attainments," as explained in that Section. We have no knowledge of these certificates, except what is stated above, nor are we in favor of issuing such credentials; but it seems to us that they must indicate on their face the fact of *not* being diplomas. Are the holders of such certificates really graduates? or is not rather their becoming graduates depending upon some conditions still to be complied with? Does the fact of being announced as such at the annual commencement, really make the candidate a graduate, although he is fully aware that he cannot obtain the diploma, which is the evidence of graduation, until after he has complied with some additional requirements?

We believe that nearly all the Colleges of Pharmacy demand proof of a practical experience of 3½ years before a candidate can be admitted to the final examination; the case cited by the Board, of an applicant who had only fifteen months' experience and still was in possession of such a certificate, must be regarded as exceptional and as not countenanced by the

Colleges. The letter states "that whatever experience or age is held to be necessary to make the applicant eligible to graduation, should be had prior to the final examination." In principle this is correct; yet the Illinois law permits graduates in medicine to become registered pharmacists without experience in the drug business and without examination; and licentiates in pharmacy may become registered pharmacists with a practical experience of two years and without qualification as to age. It seems to us, therefore, that the Board calls attention to the above mainly because of the apparent difference between the practice and the professed requirements of one or more Colleges, and consequently of the probable unreliability of documents issued by them. The letter concludes as follows:

The Illinois Board of Pharmacy, in the exercise of sound judgment, and having at heart the best interest of Pharmacy, will decline to grant registration to holders of such certificates without examination; and if, after a reasonable time, the practice of issuing such certificates is not abandoned, this Board will decline to accept as "satisfactory" the *diploma* of any College following the practice.

PREVENTION OF EPIDEMIC CHOLERA IN AMERICA.—The following report was adopted by the American Public Health Association and the Conference of State Boards of Health, at their meetings held in the city of St. Louis in October, 1884. We have purposely deferred its publication until the present time, when the approaching warm weather is likely to secure for it more careful attention than would be accorded to the recommendations during the winter months.

To the Conference of State Boards of Health:

MR. PRESIDENT AND MEMBERS: Your Committee, to whom was referred papers relating to the practical work required for the prevention of epidemic cholera in this country, respectfully report as follows:

Origin and Dissemination.—There are three essential factors to the prevalence of cholera in this country as an epidemic, (1) the importation of the disease by means of ships more or less directly from its only place of origin in India; (2) local unsanitary conditions favorable to the reception and development of the disease; (3) persons sick with the disease in some of its stages, or things infected by such sick persons, to carry it from place to place. These three factors naturally suggest the methods of combating the disease, for which there is needed practical work—international, national, and inter-state, State and local. So far as relates to State and local boards of health, their organization and activities are greater than ever before; but it must be admitted, that after cholera has been introduced into a country, inland quarantines are not easily and successfully maintained, although efforts in this direction are then advisable.

In view of the threatened introduction of cholera into this country during the coming year, and the consequent immense waste of life and property values through derangements of commerce, trade and productive industries, it is the sense of this conference that the general government should maintain such a national health service as shall, by rigid inspection at the port of embarkation, question the freedom from disease and infection of all persons and things from infected districts, and shall secure the surveillance of such persons and things while on shipboard, and when necessary, detention at quarantine stations on this side for treatment and disinfection.

Official Inspection.—In view of the present threatening aspect of Asiatic

cholera, and the constant danger from other communicable diseases occurring at foreign ports having commercial relations with the United States, we urge upon Congress to provide for the appointment and maintenance at all such foreign ports where cholera, yellow fever, plague, small pox, or scarlet fever exists, or are liable to exist, of medical officers of health, the same being either accredited consuls, or attached to the consulates. The duties of these officers shall be to give notice, by telegraph when practicable, of the existence or appearance of any of the above-named diseases to some constituted authority in this country; to give notice of the departure of any vessel known or suspected to be infected for any port in the United States; and, whenever requested by the master of any vessel about to load or leave for this country, to inspect thoroughly such vessel in all her parts, and also her cargo, her crew and passengers, to use such cleansing and disinfection as he may deem necessary, and to satisfy himself that all persons about to sail are free from dangerous communicable diseases, are not recently from infected places, and are properly protected from small-pox, giving to her commander a certificate of the inspection and of all precautionary measures taken. And it shall be the duty of the central authority in this country promptly to transmit intelligence of the existence of the above-mentioned diseases at foreign ports and places, and of the departure of dangerous vessels for the United States and Canada, to all State and local health authorities in the country which may be interested in the same.

We further recommend, in case of those foreign ports which have no consular agents of this country, or no telegraphic communication with this country, and which are liable to transmit pestilence through commercial intercourse, that one or more medical officers be chosen to visit such ports as often as may be deemed necessary by the central health authority in this country, so as to give trustworthy information of the health and sanitary condition of those places.

Canadian Health Alliance.—Inasmuch as the Dominion of Canada is equally interested with the United States in protecting itself and the United States from the importation of dangerous diseases, we suggest that Congress take such measures as will bring about concerted action with the Dominion and the British government, by which the consuls of this country or of England at foreign ports shall examine and take such action as they may deem effective, and notify the authorities of such government as has authority over any port to which any ship may sail in the United States or Canada, in order that such government may be in a position to take effective measures against the importation of these diseases.

We are gratified that the authorities of the Dominion of Canada and of the Province of Ontario have taken active steps toward protecting the people of Canada, and indirectly those of the United States, by the adoption of extensive quarantine regulations. We feel, however, that with respect to those regulations regarding the landing of passengers from the mail steamers along the St. Lawrence, etc., further special regulations for the thorough disinfection of the baggage and effects of all passengers, cabin or steerage, as come from infected ports or places, should be carried out in a manner similar to that recommended by the National Board of Health. Believing that the importation of cholera into this country has usually attended the presence of immigrants from infected countries, we therefore recommend that all such immigrants be prevented from landing at our ports until such time as the danger of the introduction of cholera by them shall have passed.

The inspection and quarantine service inaugurated by the National Board of Health, and set forth in the paper by Dr. Smart before this Conference, but which system is now inoperative for want of an appropriation by Congress, meets with our cordial approval. To enable these protective measures to be carried out, we recommend that Congress be urged in the strongest terms to legislate on this subject at an early date in its coming session, and to appropriate such funds as may be needful. The expenses incident

to the work which has to be performed at foreign ports, and the establishment of refuge stations at points on our own coast for the detention and treatment of infected vessels arriving from foreign ports, should undoubtedly be borne by the National Government, and not by individual States or municipalities; for the benefits accruing therefrom are general, and not restricted to localities, although some ports and cities on the coast may have a more immediate interest in the matter than others in the interior. It is probable, however, that this national protective work may not be sufficient.

Local Safeguards.—It will undoubtedly delay and lessen the chances of invasion, but it may not prevent invasion. The poison of the disease is subtle, and may effect an entrance into the country at some unguarded point. The funds necessary to the stamping out of the disease in a particular locality, and to the prevention of its spread to other localities, might in some instances be borne by the municipality or State affected; but should the disease occur in a locality which has failed or is unable to make provision for the occurrence, its spread to other cities and States would be imminent. The want of means at the infected point would be disastrous to many others. Congress has recognized the necessity for aid to State and local boards of health under similar conditions in the case of yellow fever. In 1879 the sum of $500,000 was appropriated, and placed at the disposal of the National Board of Health; and the records show that of this sum $160,000 was employed in combating the epidemic of that year. We therefore recommend that the influence of this Conference be used with the view of having appropriated by the National legislature the sum of $500,000, to be used, or as much thereof as may be needful, in case of a cholera invasion, in stamping out the disease from the infected localities, and in preventing its spread from State to State.

The removal of local unsanitary conditions favorable to the development of cholera is the special work of State and local boards of health. Much has been done already in some States, but much remains which should receive immediate attention. Where it can be done, State sanitary inspectors should be appointed to visit all towns and cities specially liable to the disease, to counsel with the local authorities as to the best methods of prevention. This work should be vigorously prosecuted before the disease reaches our shores.

Advice to Citizens.—The cause of cholera is contained in the discharges from persons affected by the disease, or in things infected by such discharges. Should the disease reach our shores, the first case, and after this the first case which reaches any given community, should be strictly isolated. All infective material from these and from any subsequent cases should be destroyed in such manner as to stamp out the disease. Intelligent sanitary precautions beforehand, and scientific disinfection and treatment in the presence of the disease, should take the place of the necessary cruelties of a panic. In case any city or town is infected, the same principles of isolation should in general be applied to the city as to the infected individual. Intercourse with other cities and places should be under sanitary supervision, substantially as set forth in the rules and regulations of the National Board of Health respecting the inspection of travelers, disinfection of effects, vehicles, etc.

Health officers and inspectors appointed by State or provincial boards of health should, in addition to other sanitary work, see that the localities have set apart, erected, or planned to be so set apart or erected, structures which shall possess the sanitary requirements of an isolation hospital. But as regards all necessary work by local boards of health, most State and provincial boards of health have printed and issued documents which give ample instruction.

Your Committee recommend that when this Conference adjourns it be to meet in Washington, D. C., the second Wednesday in December, 1884, and that the Secretary of this conference be directed to invite the attendance at that time of the quarantine officers and the health officers of the principal cities in the United States and Canada; and that all delegates to that meet-

ing be prepared to report the sanitary status of their State or locality, and what steps have been taken to improve the same, and to prevent the introduction of disease.

All of which is respectfully submitted.

HENRY B. BAKER,
Secretary State Board of Health of Michigan.
H. P. WALCOTT,
Chairman Health Department of Massachusetts.
S. S. HERRICK,
Secretary State Board of Health of Louisiana.
PETER H. BRYCE,
Secretary Provincial Board of Health, Ontario, Canada.
JOHN H. RAUCH,
Secretary State Board of Health of Illinois.
Committee.

OBITUARY.

SAMUEL SIMES, a graduate of the Philadelphia College of Pharmacy, class 1833, died in this city, March 6th, of apoplexy. He was for many years in business at the corner of Twelfth and Chestnut streets, and identified himself with the Pennsylvania Salt Manufacturing Company, whose treasurer he was. He reached the ripe age of 71 years. His thesis on Daturia was published in Vol. V of this Journal (1833); he originated tinctura cinchonæ ferrata in 1853, and in 1855 contributed to the Journal a paper on chocolate and iron lozenges.

EDWARD ZEITLER, PH.G., class 1858, died in Philadelphia, March 3d, of consumption. He was the son of the first manufacturer of matches in this city, and was for a long time established as a pharmacist in the northeastern section of Philadelphia.

ROBERT W. DICKSON, PH.G., class 1862, died March 18th, of cirrhosis of the liver. He was for some time engaged in the drug business, and more recently he was in the employ of Powers & Weightman.

WILLIAM H. CRAWFORD died suddenly at St. Louis, March 17th, of fatty degeneration of the heart, about an hour after he had left his place of business, in apparently good health. He was born in Donegal, Ireland, and when quite young emigrated with his parents to the United States, the family living in Wheeling before they came to St. Louis, where the deceased entered the drug store of S. D. Hendall, and in 1861 started in business for himself. He took an active part in the organization of the St. Louis College of Pharmacy, his interest in the institution remaining unabated to the close of his life. In 1864 he became a member of the American Pharmaceutical Association, served as local secretary to the meeting held in 1871, and as one of the vice-presidents in 1878–1879, and for 24 years has faithfully acted as authorized agent of the Association.

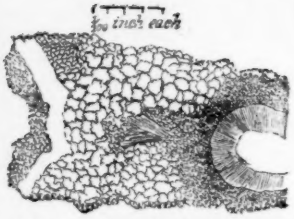

FIG. 14.—Capsule: transverse section through dorsal suture.

FIG. 15.—Capsule: longitudinal section.

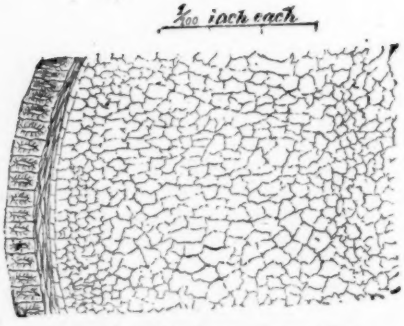

FIG. 17.—Seed: transverse section.

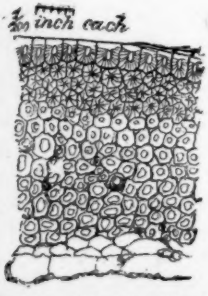

FIG. 16.—Capsule: transverse section near ventral suture.

FIG. 18.
Testa: exterior view.

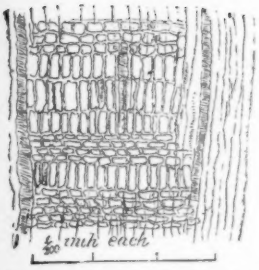

FIG. 7.—Stem: radial section.

FIG. 8.—Stem: tangential section

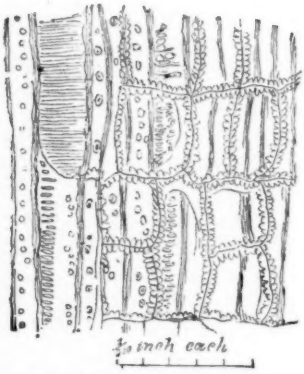

FIG. 9.—Stem: radial section.

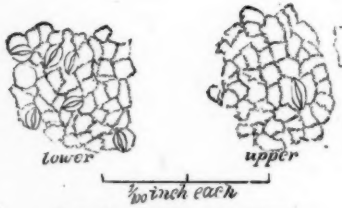

FIG. 10.—Epidermis of leaf.

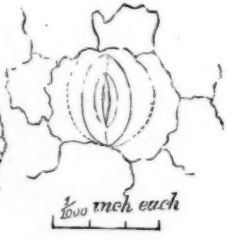

FIG. 11.—Stoma.

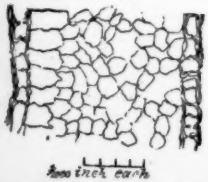

FIG. 12.—Leaf: transverse section, with stoma on lower surface.

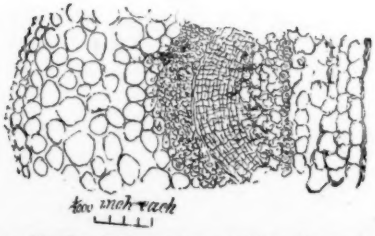

FIG. 13.—Leaf: transverse section, through midrib.

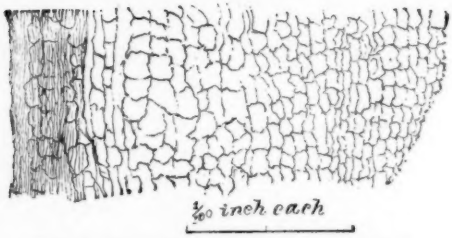

FIG. 4.—Stem-bark: longitudinal section.

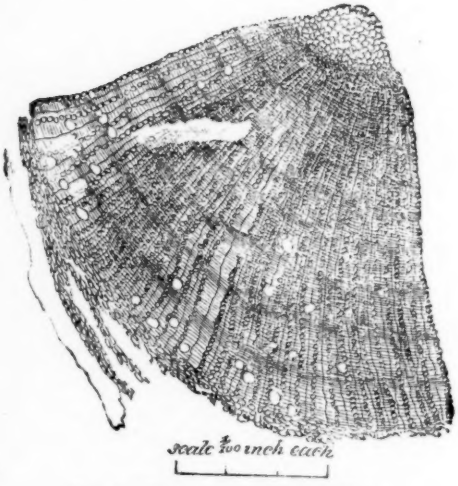

FIG. 5.—Stem: transverse section.

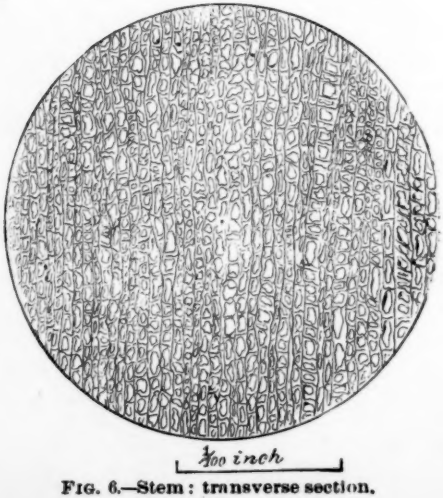

FIG. 6.—Stem: transverse section.

Illicium Floridanum.—Ellis.

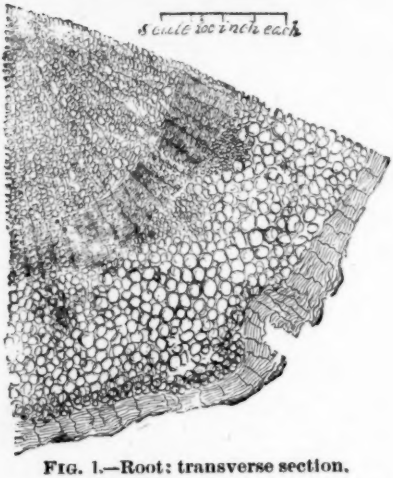

FIG. 1.—Root: transverse section.

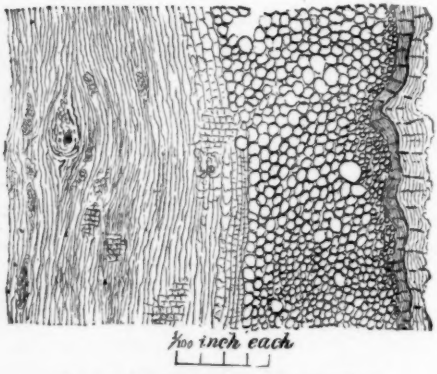

FIG. 2.—Root: longitudinal section.

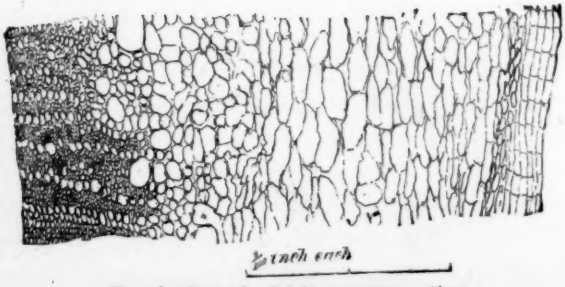

FIG. 3.—Stem-bark: transverse section.